Vol. 1049 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

December 25, 1984

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

December 25, 1984 Volume 1049 Number 4

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1049 OG 26
Notice of Maintenance Fees Payable	1049 OG 26
Reissue Applications Filed	1049 OG 26
Requests for Reexaminations Filed	1049 OG 27
National Inventors Expo	1049 OG 27
Errata	1049 OG 27
Recordation of Trade Name	1049 OG 28
PTO Status	1049 OG 29
Public Information Contacts Subject Index	1049 OG 30
Patent Certificates of Correction	1049 OG 36
Disclaimers	1049 OG 36
Dedication	1049 OG 36
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1049 OG 37
Condition of Patent Applications	1049 OG 38
Reexaminations	1397
Reissue Patents Granted (31,775)	1399
Plant Patents Granted (5,376)	1401
Patents Granted	
General and Mechanical (4,489,443)	1403
Chemical (4,490,149)	1647
Electrical (4,490,573)	1761
Design Patents Granted (276,854)	1859
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 52
Classification of	
Patents (Including Reissues and Reexaminations)	PI 57
Designs and Plants	PI 60
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 61
Designs and Plants	PI 62
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Apr. 13, 1984.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Dec. 22, 1981 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,306,315 through 4,307,469

Reissue Patents based on the above identified patents. No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f))	$ 200.00
By other than a small entity	$ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f))	$ 50.00
By other than a small entity	$ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,354,057, Re. S.N. 660,494, Filed Oct. 12, 1984, Cl. 179/1.05A, PREDICTIVE SIGNAL CODING WITH PARTITIONED QUANTIZATION, Bishnu S. Atal, Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: S. E. Hollander, Ex. Gp.: 235

4,354,425, Re. S.N. 662,368, Filed Oct. 18, 1984, Cl. 092/094, FIRE-SAFE VALVE ACTUATOR, Billy R. Bruton, et al., Owner of Record: *U. S. Industries, Inc., New York, N.Y.,* Attorney or Agent: E. Mickey Hubbard, et al., Ex. Gp.: 341

4,354,893, Re. S.N. 663,069, Filed Oct. 19, 1984, Cl. 156/497, COMBINATION ROOFING MATERIAL UNROLLING AND HEAT APPLYING APPARATUS, William E. Kugler, et al., Owner of Record: *Inventor,* Attorney or Agent: Philip H. Sheridan, et al., Ex. Gp.: 131

4,370,821, Re. S.N. 657,808, Filed Oct. 4, 1984, Cl. 040/497, ROTARY MAGAZINE ASSEMBLY FOR HOLDING INFORMATION BEARING CARDS, Falk-Junger Eichner, Owner of Record: *Fellowes Manufacturing Co., Itasca, Ill.,* Attorney or Agent: Talivaldis Cepuritis, et al., Ex. Gp.: 333

4,392,332, Re. S.N. 620,716, Filed June 14, 1984, Cl. 51/092.085, ICE SKATE SHARPENER, Glenn Sakcriska, Owner of Record: *Canadian Skate Contours, Mississauga, Ontario, Canada,* Attorney or Agent: James M. Deimen, Ex. Gp.: 323

4,392,844, Re. S.N. 656,722, Filed Oct. 1, 1984, Cl. 493/399, METHOD AND APPARATUS FOR CORRECTING STACK LEAN IN A ZIG-ZAG FOLDED WEB, James B. Fulk, et al., Owner of Record: *Paper Converting Machine Co., Green Bay, Wis.,* Attorney or Agent: Jerome F. Fallon, et al., Ex. Gp.: 321

4,409,000, Re. S.N. 664,648, Filed Oct. 25, 1984, Cl. 044/070, COMBINATIONS OF HYDROXY AMINES AND CARBOXYLIC DISPERSANTS AS FUEL ADDITIVES, William M. Lesuer, Owner of Record: *Lubrizol Corp., Wickliffe, Ohio,* Attorney or Agent: Roger Y. K. Hsu, et al., Ex. Gp.: 118

4,413,619, Re. S.N. 578,979, Filed Feb. 10, 1984, Cl. 128/76R, PORTABLE CERVICAL COLLAR, Geoffrey C. Garth, Owner of Record: *Inventor,* Attorney or Agent: Robert E. Strauss, Ex. Gp.: 332

4,416,510, Re. S.N. 664,004, Filed Oct. 22, 1984, Cl. 350/106, RETROREFLECTIVE STRUCTURE AND METHOD OF MANUFACTURING THE SAME, Ludwig Eigenmann, Owner of Record: *Inventor,* Attorney or Agent: Michael J. Striker, Ex. Gp.: 257

4,431,434, Re. S.N. 659,683, Filed Oct. 11, 1984, Cl. 055/135, ELECTROSTATIC PRECIPITATOR USING A TEMPERATURE CONTROLLED ELECTRODE COLLECTOR, George A. Rinard, et al., Owner of Record: *University of Denver Colorado Seminary, Denver, Colo.,* Attorney or Agent: James F. Pittenger, et al., Ex. Gp.: 135

4,439,420, Re. S.N. 665,552, Filed Oct. 29, 1984, Cl. 424/078, ABSORBABLE HEMOSTATIC COMPOSITION, Frank V. Mattei, et al., Owner of Record: *Ethicon, Inc., Somerville, N.J.,* Attorney or Agent: Leonard P. Prusak, et al., Ex. Gp.: 125

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,132,605, Reexam. No. 90/000,670, Requested: Nov. 23, 1984, Cl. 204/1T, METHOD FOR EVALUATING THE QUALITY OF ELECTROPLATING BATHS, Dennis M. Tench, et al., Owner of Record: *Rockwell International Corp., Thousand Oaks, Calif.,* Attorney or Agent: Craig O. Malin, Ex. Gp.: 112, Requester: Rockwell International Corp., Thousand Oaks, Calif.

4,257,937, Reexam. No. 90/000,672, Requested: Nov. 23, 1984, Cl. 524/445, MODIFIED POLYESTER COMPOSITIONS, Stuart C. Cohen, et al., Owner of Record: *General Electric Co., Pittsfield, Mass.,* Attorney or Agent: William F. Mufatti, Ex. Gp.: 151, Requester: General Electric Co., Pittsfield, Mass.

National Inventors Expo

The Patent and Trademark Office, the National Council of Patent Law Associations and the National Inventors Hall of Fame Foundation, Inc., will sponsor the Thirteenth Annual National Inventors Expo in the Public Search Room on Saturday, Feb. 9, 1985 from 1:00 p.m. to 5:00 p.m. and Sunday, Feb. 10, 1985 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days. Inventors will be inducted into the National Inventors Hall of Fame on Sunday, Feb. 10 at 2:00 p.m.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, Feb. 8, 1985 at 5:00 p.m. The removal of all personal property from the Search Room would be appreciated.

GERALD J. MOSSINGHOFF,
Dec. 18, 1984. *Commissioner of Patents and Trademarks.*

Erratum

Registration Nos. 760,326 and 760,327, listed in the "Index of Registrants" section of the Trademark Official Gazette of Feb. 21, 1984, at TMI 7, was incorrectly identified as Ernst Leitz, G.m.b.H.

The registrant's name as corrected is Ernst Leitz Wetzlar, G.m.b.H.

DANIEL L. SKOLER,
Nov. 16, 1984. *Deputy Assistant Commissioner for Trademarks.*

Erratum

Registration No. 776,985, listed in the "Index of Registrants" section of the Trademark Official Gazette of Sept. 18, 1984, at TMI 3, was incorrectly identified as Applied Power Industries, Inc.

The registrant's name as corrected is Applied Power, Inc.

DANIEL L. SKOLER,
Nov. 16, 1984. *Deputy Assistant Commissioner for Trademarks.*

Errata

The following registrations were inadvertently listed as canceled in the "Index of Registrants" section of the Trademark Official Gazette of Sept. 18, 1984:

B. F. Goodrich Co., Akron, OH, Reg. No. 1,088,644	TMI 5	TMOG Sept. 18, 1984
Hercules, Inc. Wilmington, Del., Reg. No, 1,088,940	TMI 14	TMOG Sept. 18, 1984
Rubber Speciality, Inc. Valley Stream, N.Y. Reg. No. 1,088,789	TMI 27	TMOG Sept. 18, 1984

Consequently, the above-identified registrations are still active.

DANIEL L. SKOLER,
Nov. 16, 1984. *Deputy Assistant Commissioner for Trademarks.*

Erratum

The following registration number was inadvertently listed as canceled in the "Trademarks Registrations Canceled, Section 8" section of the Trademark Official Gazette of Sept. 28, 1982:

1,038,775	TM 620	Sept. 28, 1982

Consequently, the above-identified registration is still active.

DANIEL L. SKOLER,
Nov. 16, 1984. *Deputy Assistant Commissioner for Trademarks.*

Dept. of the Treasury
U.S. Customs Service
(T.D. 84-217)

Recordation of Trade name: "VILLEROY & BOCH KERAMISCHE WERKE KG"

Agency: U.S. Customs Service, Dept. of the Treasury

Action: Notice of Recordation

Summary: On Aug. 3, 1984, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "VILLEROY & BOCH KERAMISCHE WERKE KG" was published in the Federal Register (49 FR 31189). The notice advised that before final action was taken on the application, consideration would be given to any relevant data, views, or arguments submitted in opposition to the recordation and received not later than Oct. 2, 1984. No responses were received in opposition to the notice.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "VILLEROY & BOCH KERAMISCHE WERKE KG", is recorded as the trade name used by Villeroy & Boch Keramische Werke KG, a limited liability partnership organized under the laws of Germany located in D-6642 Mettlach, West Germany. The trade name is used in connection with the following merchandise manufactured in West Germany and France: housewares; tableware and glassware; ceramic tiles; and ceramic sanitary installation.

Date: Nov. 1, 1984

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

STEVEN PINTER,

Oct. 26, 1984. *Acting Director, Entry Procedures and Penalties Division.*

Status of PTO Services

The following is an update of the status of PTO services for November 1984:

Service Item	FY 1985 Performance Goal (Calendar Days)	Monthly Average	Comment
Filing Receipts:			
Patents	22	34	Due to automation problems.
Trademarks	30	24	
Patent/Trademark Copies:			
Window Coupons	5	97% within 5 days	
Mail Coupons	29	99% within 29 days*	
Letter Orders	34	99% within 29 days*	
Date of oldest unfilled order		November 23, 1984	
Certified Copies:			
Trademark Registrations	30	25	
Status Copies (excluding title)	15	96% within 15 days	
Applications-As-Filed	20	96% within 7 days	
File-Wrapper/Contents	N/A	99% within 7 days	
Walk-up Certification	1	99% within 24 hours	
Trademark Search Library:			
Filing Drawings	21	27	
Filing Reg. Certificates	3	4	
Assignments:			
Patents	25	19	
Trademarks	25	15	
Avg. Days from Issue Fee Payment to Issue Date	90–100	88	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 2 days late	Delay in printing process.
Patent Grants Mailed	Issue Date	On schedule	
Patent Copies Available	Issue Date	97% on issue date	
Trademark Copies Available	Issue Date	99% on issue date	
Trademark Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 1 day late	Delay in GPO mailing.
Trademark Regs. Mailed	Issue Date	On schedule	

*Figures include postal processing and delivery time.

INFORMATION ITEMS

- The Public Service Center has moved from CP3-2C24 to CP3-ID01-A (Lobby Level) and is adjacent to the File Information Unit. Its address is:

  Public Service Center
  U.S. Patent and Trademark Office
  CP3-ID01-A
  Washington, D.C. 20231

- Beginning with the issue of Dec. 4, 1984, a new patent printing contractor will be providing new issue copies for distribution by our patent/trademark copy sales contractor. We will be experiencing brief delays in copy availability during the start-up effort of this new contract.

- The following is an index of public information contacts within the PTO, arranged by subject. This index contains three major sections — General, Patents, and Trademarks.

Nov. 30, 1984.

THERESA A. BRELSFORD
Assistant Commissioner for Administration.

PUBLIC INFORMATION CONTACTS
SUBJECT INDEX
GENERAL

AREA CODE (703)
unless otherwise noted.

Inquiry — Contact Point

Address boxes, PTO Special
These boxes should be used *only* for the specified purposes. *Only* material for which the special boxes have been established should be enclosed.

Address to:
Box ____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 4 — Mail for the Office of Legislation and International Affairs.
Box 5 — "No fee" mail related to trademarks.
Box 7 — Reissue applications for patents involved in litigation and any subsequently filed papers for these applications.
Box 8 — All papers for the Office of the Solicitor.
Box 9 — Coupon orders for U.S. patent and trademark copies.
Box 10 — Orders for certified copies of patent and trademark applications.
Box 12 — Contributions to the Examiner Education Program.
Box PCT — Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam — Mail related to reexamination applications.

Attorney's Roster 557-1728
Cashier's Window
Patents and Trademarks 557-3230
T.S. Information Systems (CopiShare Cards) 557-0318
Congressional Affairs 557-1310
CopiShare Cards(T.S. Information Systems) 557-2469
Deposit Accounts
General Information 557-3227
Remittances
Note: Please mail *Deposit Account Remittances only* to:
Patent and Trademark Office
P.O. Box 70541
Chicago, Ill. 60673

Drop Boxes
Department of Commerce
Main Entrance
14th and E. St., N.W.
Washington, D.C.

Patent and Trademark Office
Crystal Plz. 3 -Lobby
Arlington, Va.
Note: (Hours 8:30 a.m. -12:00 p.m.
Monday—Friday)

Employment 557-3631
Fees
Fee Rates 557-3054
Fee Receipts 557-3230
General Information 557-3158
Refunds 557-3751
File Information Unit 557-1625
(Formerly called Record Room)
Information
General 557-3080
Services (Public Service Center) 557-5168
Journal of Patent Office Society (JPOS)
Note: All questions should be addressed to:
Box 2600
Arlington, Va. 22202
Official Gazette, Notices 557-3794
Official Gazette (Government Printing Office)
Distribution
Subscription Problems (Patents and Trademarks) 202/275-3054
Public Affairs 557-3428
Addenda Sets, Sale of
Changes in Classes 557-5100
Amendments
General Information 557-3080
Specific Pending Applications . . . . . Appropriate Examining Group
Note: Rule 312 Amendments should be mailed to:

U.S. Patent and Trademark Office
Office of Publications
Allowed Files Section
Crystal Plz. 2 Room-10C28
Washington, D.C. 20231

Applications
Examination ..... Appropriate Examining Group
General Information 557-3255
PCT - General Information 557-2003
Post-Examination 557-3283
Pre-Examination 557-3254
Re-Examination - General Information 557-3831
Status Inquiry of Pending Applications 557-2478
Assignments
Changes Affecting Title of
Pending Applications and
Patented Files 557-3266
Attorney's Window
(See *Public Service Window*)
CASSIS (Classification and Search Support
Information System)
Access to Cassis, training and
problem resolution 557-0400
Certificates of Correction 557-0708
Classification Definitions
and Orders - (Sale Of) 557-5103
Classification of Published Patents 557-3951
Complaints (Services) 557-5168
Copies
Abandoned File Histories 557-1625
Abstracts of Title 557-3826
Applications as Filed
(Also Abandoned and Patented) 377-3359
File Wrapper and Contents 202/337-3359
Certified Copies of any document
(except assignments) 202/377-3359
Foreign Patents 557-3545
Patented File Histories 557-1625
Pending Patent Applications 202/377-3359
U.S. Patents 202/377-2535
Disclaimers 557-4282
Disclosure Document Program 557-3378
Duty of Disclosure Matters 557-8384
Files
Abandoned File Histories 557-1625
Patented File Histories 557-1625
Pending Patent Applications 202/557-3359
Filing Receipts 557-3855
Forms
Patents 557-3080
PCT 557-2003
Foreign Patents (references)
(Hours 8:45 a.m. - 5:00 p.m.) 557-3545
Fraud (Patent Attorneys) 557-8384
Issue Fee
Balance of Issue Fee Transmittals 557-3283
Issue Fee Receipt, Incorrect 557-3283
Issue Fee Receipt, Non-Receipt 557-3283
Lapse Notices 557-3283
Inspection of patent files 557-1625
Inventors
Deceased ..... Solicitor 557-4035
Correction of error in joining inventors
Patents ..... Solicitor 557-4035
Applications ..... Appropriate Examiner
License (Request to file patent application abroad) 557-4955
Manual of Patent Classification
General Information 557-5103
Index to 557-0400
Manual of Classification, Sale of
Note: Address inquiries to:
Mr. C. A. LaBarre
Superintendent of Documents
United States Government Printing Office
Washington, D.C. 20402
Subclass Listings, Sale of 557-5103
Manual of Patent Examining Procedure (MPEP) 557-3070
Master Classified File (MCF) 557-0400

Notice of Allowance
Notice of Allowance, Incorrect ..... Appropriate Examining Group
Notice of Allowance, Lost ..... Appropriate Examining Group
Notice of Allowance, Non-Receipt ..... Appropriate Examining Group
Notices of Appeal
Board of Patent Appeals 557–4101
Court of Appeals for the Federal Circuit (CAFC) 557–4035
Patent Depository Library Program 557–9686
Patent Index
To use the Index 557–3951
Index Support 557–5103
PCT (Patent Cooperation Treaty) 557–2003
Petitions
Abandonment, Holding of ..... Appropriate Examining Group Director
invoking supervisory authority of the Commissioner
Amendment After appeal ..... Examiner of Record
With appeal ..... Examiner of Record
Refusal to enter an amendent ..... Appropriate Examining Group Director
invoking supervisory authority of the Commissioner
Refusal to enter an amendment ..... Appropriate Examining Group Director
after allowance, invoking supervisory authority of the Commissioner
Appeals, Reinstate dismissed ..... Appropriate Examining Group Director
by group appeals clerk
Application
Acceptance of application ..... Solicitor 557–4035
filed by other than inventor
Access to ..... Solicitor 557–4035
Concerning appealed application ..... Appropriate Examining Group Director
before transfer of jurisdiction to Board of Appeals
Assignments and issuance of patents ..... Deputy Assistant Commissioner for Patents 557–4282
Attorney, Withdrawal of 557–4035
Cancel "new matter", Requirement to ..... Appropriate Examining Group Director
from specification, invoking supervisory authority of the Commissioner
Certificates of Correction, Refusal to issue ..... Solicitor 557–4035
Concurrent ex parte and inter partes ..... Appropriate Examining Group Director
prosecution
Defensive publication
Approval of ..... Appropriate Supervisory Patent Examiner (SPE)
Defensive publication following denial ..... Appropriate Examining Group Director
Disclaimers, Relating to ..... Deputy Assistant Commissioner for Patents 557–2621
Divisional reissue ..... Special Assistant to A/C for Patents 557–3054
Examiner's statement on petition ..... Appropriate Examining Group Director
to set aside examiner's holding
Exception to undertakings under ..... Committee on Enrollment 557–2012
37 CFR 1.341(g) (re former examiners)
Ex parte questions in cases before the CAFC ..... Solicitor 557–4035
Express abandonment after ..... Deputy Assistant Commissioner for Patents 557–2621
notice of allowance
Expunge Papers ..... Assistant Commissioner for Patents 557–3054

Extensions of Time
Extension of time to file amendment ..... Board of Appeals 557–4072
relating to rejection of claim(s) by Board of Appeals
Extension of time in court matters ..... Solicitor 557–4035
Extension of time during examination ..... Appropriate Examining Group
in group
Extension of time to file a supplemental ..... Board of Appeals 557–4101
reply brief
First request for extension of time ..... Clerk, Board of Appeals 557–4101
to appeal to the CAFC or commence a civil action
First request for one-month extension ..... Appropriate Examining Group Clerk
to file appeal or reply brief in appeals to Board of Appeals
Filing Date ..... Special Assistant to A/C for Patents 557–3054

Final decision of examiner, From ..... Appropriate Examining Group Director
requiring restriction

Final rejection, Premature ..... Appropriate Examining Group Director
invoking supervisory authority of the Commissioner
Formal sufficiency and propriety of ..... Appropriate Examining Group Director
affidavits, invoking supervisory authority of the Commissioner
Interferences
Patent Interferences, Access to ..... Board of Patent Interferences 557–4000
applications
Patent Interferences, Access to ..... Board of Patent Interferences 557–4000
unopened preliminary statements
Patent Interferences, From action ..... Board of Patent Interferences 557–4000
by a primary examiner or an interlocutory action
Patent Interferences, Late ..... Board of Patent Interferences 557–4000
settlement papers
Patent Interferences, Priority ..... Board of Patent Interferences 557–4000
papers in patent applications
Institute an interference, Invoking ..... Appropriate Examining Group Director
supervisory authority of the Commissioner
Interview with the examiner after ..... Appropriate Examining Group Director
application sent to issue
Issuance, Defer ..... Deputy Assistant Commissioner for Patents 557–2621

Late Payment
Of Issue Fee ..... Deputy Assistant Commissioner for Patents 557–2621
Of additional Issue Fee ..... Deputy Assistant Commissioner for Patents 557–2621
License to file in foreign countries ..... Director, Group 220 557–2877
Limited recognition to prosecute ..... Committee on Enrollment 557–2877
specified application(s)
Make Special
Prospective manufacture, Infringment, ... Assistant Commissioner for Patents 557–3811
Inability to interest capital
Make special within jurisdiction ..... Board of Appeals 557–4072
of Board of Appeals
Make Special
Applicant's age or health, ... Appropriate Examining Group Director
Division, continuation or continuation-in-part of earlier application, Environmental Quality Program, Special Examining Procedure (accelerated examination), Energy Program, Recombinant DNA
Original oaths, Return of ..... Appropriate Examining Group Director
Priority papers, Late ..... Deputy Assistant Commissioner for Patents 557–2621
Prosecution, reopen after decision ..... Appropriate Examining Group Director
by Board of Appeals
Public use proceedings ..... Assistant Commissioner for Patents 557–3811
Reconsideration of decision ..... Appropriate Primary Examiner
on motion
Registration to practice ..... Enrollment and Discipline 557–2012
before the PTO
Rehearing, reconsideration, or ..... Board of Appeals 557–4072
modification of Board decision
Rejection, Final ..... Appropriate Examining Group Director
Restriction requirement holding ..... Appropriate Examining Group Director

Revive
To revive ..... Deputy Assistant Commissioner for Patents 577–4282
To revive, Conditional ..... Deputy Assistant Commissioner for Patents 557–2621
Strike patent application ..... Assistant Commissioner for Patents 557–8384
Supervisory authority of Commissioner ..... Deputy Assistant Commissioner for Patents 557–2621
Invoke in matters concerning the Office of Administration
Supervisory authority of Commissioner ..... Deputy Assistant Commissioner for Patents 557–2621
Invoke in matters within the responsibility of the Patent Examining Operation

Suspension of action
Second or subsequent ..... Appropriate Examining Group Director

Suspension of rules
Relating to the examining of patent applications ..... Deputy Assistant Commissioner for Patents 557-4282
Suspension of rules relating to patent examining not otherwise covered ..... Assistant Commissioner for Patents 557-3054
Suspension of rules in patent matters administered by the Office of Administration ..... Deputy Assistant Commissioner for Patents 557-4282
Withdraw from issue ..... Deputy Assistant Commissioner for Patents 557-4282

Protests Patent 557-8384
Public Service Window 557-2833
(Formerly called Attorney's Window - Pick Up Copies)
Record Room (Patents and Abandoned Files)
(See File Information Unit)
Reexaminations
General Questions 557-8384
Reexamination Examiners ..... Appropriate Examining Group
Reexaminaton Pre-processing 557-3831
Reissues ..... Appropriate Examining Group
Return Receipt Post Cards 557-3232
Search Room, Assignments
(Hours 8:30 a.m. - 4:45 p.m.) 557-3826
Search Room, Public Patent (reference to patents and indices)
High-Ceiling Area (Hours 8:00 a.m. - 6:00 p.m.)
Low-Ceiling Area (Hours 8:00 a.m. - 8:00 p.m.)
Secrecy Orders 557-1625
Subclass Data File (SDF) 557-0400
Subclass Listings 557-5103
Terminal Disclaimers 557-0708
Affidavits
Of Use (Section 8) ..... Post Registration Team 557-3266
Of Incontestability (Section 12) ..... Post Registration Team 557-1986

Amendments
After Publication or Allowance ..... Quality Review Clerk 557-5249
After Registration ..... Post Registration Team 557-1986
General Information ..... Office of Public Affairs 557-3881
Specific Pending Application ..... Appropriate Law Office
Appeal
Final Refusal by Examining Attorney 557-3551
Applications
Examination ..... Appropriate Law Office
General Information ..... Office of Public Affairs 557-3881
Informal Applications 557-9629
Post Examination 557-1986
Power of Attorney re pending applications ..... Secretary of Appropriate Law Office
Pre Examination 557-5255
Status Inquiry of Pending Applications ..... Trademark Services Division 557-5249
Status Inquiry of Registered Files 557-3282
Assignments
Changes Affecting Title of Pending Applications and Registered Files ..... Assignment Branch 557-3266

Attorney's Window
(See *Public Service Window*)
Cancellations
Cancellation of Registration ..... Trademark Trial and Appeal Board 557-3551
Voluntary Surrender of Registration ..... Post Registration Team 557-1986
Certificates of Correction 557-1986
Classification of Goods and Services
Specific Application ..... Appropriate Law Office
General Information 557-3268
Complaints (Services) 557-5168

Concurrent Use Proceeding	Trademark Trial and Appeal Board 557-3551
Copies	
Abandoned File Histories	557-1625
Certificates of Non-Registration for Kuwait	557-3268
Certified Copies of Registrations	557-1986
Certified Copies of any document (except trademark registration)	202/377-3359
Pending Application Files	202/377-2270
Printed Copies of Registration	202/377-2535
Registered File Histories	557-3826
Status Copies of Registration	557-1986
Title Records (for applications and registrations)	557-3266
Corrections	
Pending Applications	Appropriate Law Office
Registrations	557-1986
Files	
Abandoned File Histories	557-1625
Pending Trademark Applications	Appropriate Law Office
Trademark Registrations	557-3281
Filing Receipts	
Corrections	557-5249
General and Specific Information	Trademark Services Division 557-5249
Forms, Trademark	557-3080
New Certificates	557-1986
Petitions	
Abandoned Application, To revive	Trademark Examining Operation Director's Office 557-3268
Application Special, To make	Trademark Examining Operation Director's Office 557-3268
All other trademark petitions	Special Assistant to A/C for Trademarks 557-7464
Protests, Letters of	Trademark Examining Operation Director's Office 557-3268
Public Service Window (Formerly called Attorney's Window - Pick Up Copies)	557-2833
Record Room (Registered and Abandoned Files) (See File Information Unit)	
Renewal, Registrations	557-1986
Return Receipt Post Cards	557-3232
Search Library (reference to trademarks) (Hours 8:00 a.m. - 5:30 p.m.)	557-3281
Search Room, Assignments Hours 8:30 a.m. - 4:45 p.m.)	557-3826
Trademark Manual of Examining Procedure (TMEP)	557-3268

PATENT NOTICES

Certificates of Correction for the Week of Dec. 25, 1984

Re. 31,625	4,434,369	4,451,282	4,460,574
D. 273,932	4,435,446	4,452,082	4,460,593
3,696,197	4,436,833	4,452,590	4,462,338
4,323,603	4,437,868	4,452,625	4,462,441
4,325,840	4,437,953	4,452,992	4,462,736
4,371,241	4,440,096	4,453,321	4,463,156
4,378,448	4,440,143	4,455,339	4,463,334
4,380,579	4,440,179	4,455,575	4,463,442
4,387,953	4,440,823	4,456,028	4,463,738
4,392,989	4,442,347	4,456,030	4,464,034
4,395,619	4,442,525	4,456,600	4,464,070
4,396,352	4,442,961	4,457,279	4,464,092
4,406,249	4,446,168	4,457,291	4,464,200
4,406,497	4,446,216	4,457,797	4,464,611
4,412,240	4,446,252	4,457,989	4,464,690
4,415,370	4,448,477	4,458,030	4,464,695
4,417,302	4,448,491	4,459,776	4,464,713
4,417,966	4,449,337	4,459,898	4,464,843
4,421,237	4,449,359	4,460,019	4,465,061
4,421,527	4,450,583	4,460,168	4,465,692
4,425,078	4,450,795	4,460,291	4,468,965
4,426,646	4,450,968	4,460,293	
4,432,792	4,450,976	4,460,551	

Disclaimers

3,555,309.—*Allen LeRoy Limberg,* Somerville, N.J. ELECTRICAL CIRCUITS. Patent dated Jan. 12, 1971. Disclaimer filed June 10, 1983, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 5 and 6 of said patent.

3,743,140.—*Charles A. Sauerbrey,* Malvern, Pa. FILLER APPARATUS WITH HOPPER AND ROTARY FEED MECHANISM FOR DISPENSING CONTROLLED VOLUMES OF MATERIALS. Patent dated July 3, 1973. Disclaimer filed May 25, 1983, by the assignee, *Berwind Corp.*

Hereby enters this disclaimer to claims 1–4 of said patent.

3,998,536.—*Norbett H. Kaupp,* Newark, N.Y. APPARATUS FOR ELECTROSTATIC PAPER STRIPPING. Patent dated Dec. 21, 1976. Disclaimer filed May 4, 1984, by the assignee, *Xerox Corp.*

Hereby enters this disclaimer to claims 1, 6, 7 and 8 of said patent.

4,399,296.—*Rodney C. Schnur,* Noank, Conn. HYPOGLYCEMIC 5-SUBSTITUTED OXAZOLIDINE-2,4-DIONES. Patent dated Aug. 16, 1983. Disclaimer filed Nov. 25, 1983, by the assignee, *Pfizer, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

Dedication

3,437,032.—*Arjan T. Manghirmalani,* Pittsford, *Andrew F. Trabold,* Fairport, and *Robert H. Figler,* Webster, N.Y. HEATED FUSER ROLL. Patent dated Apr. 8, 1969. Dedication filed Jan. 19, 1983, by the assignee, *Xerox Corp.*

Hereby dedicates to the Public the entire remaining term of said patent.

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	New York Public Library (The Research Libraries)	(212) 930-0850
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	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
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	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 1, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	8-20-81
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	3-14-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	8-14-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	5-18-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	8-28-74
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-22-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	9-29-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	2-22-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	5-01-82
DESIGN, GROUP 290—K. L. CAGE, Director	4-30-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	8-01-80
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	6-04-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	9-27-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	7-09-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	9-07-82

Expiration of patents: The patents within the range of numbers indicated below expire during December 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,355,744 to 3,360,799, inclusive

Plant Patents ..... Numbers 2,781 to 2,783 inclusive

REEXAMINATIONS

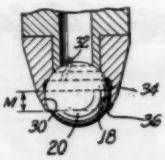
DECEMBER 25, 1984

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,425,779 (288th)
PRESSURIZED MARKING INSTRUMENT

Paul C. Fisher, 14226 W. Greenleaf St., Sherman Oaks, Calif. 91403; Herman Schub, Chicago, and Roger A. Kennedy, Addison, both of Ill., assignors to Paul C. Fisher, Sherman Oaks, Calif.

Continuation-in-part of Ser. No. 576,721, Sep. 1, 1966,.
Reexamination Request No. 90/000,427, Jul. 29, 1983.
Reexamination Certificate for Patent No. 3,425,779, issued Feb. 4, 1969, Ser. No. 660,155, Jul. 24, 1967.
Int. Cl.³ C09D *11/10*
U.S. Cl. 401—190



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–9** is confirmed.

1. A ball point marking instrument which includes:
a sealed marking fluid reservoir having a socket located at one of the extremities thereof;
a ball rotatably mounted within said socket so as to extend into the interior of and to the exterior of said reservoir;
a marking fluid within said fluid reservoir in contact with said ball;
a charge of pressurized gas within said reservoir at the extremity thereof remote from said sockets, said pressurized gas serving to force said marking fluid against said ball;
said marking fluid being a viscoelastic, strongly cohesive, strongly adhesive, film-forming composition comprising a mixture of at least one solvent, at least one coloring agent, and at least one elastomeric-type polymer which is soluble in said solvent, said polymer being selected from the group consisting of carboxypolymethylene type polymers, cross-linked acrylic acid emulsion copolymers, and polyvinylpyrrolidone polymers.

B1 4,164,714 (289th)
POLYPHASE PDM AMPLIFIER

Hilmer I. Swanson, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio

Reexamination Request No. 90/000,476, Dec. 5, 1983.
Reexamination Certificate for Patent No. 4,164,714, issued Aug. 14, 1979, Ser. No. 836,832, Sep. 26, 1977.
Int. Cl.³ H03F *3/38*
U.S. Cl. 330—10

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

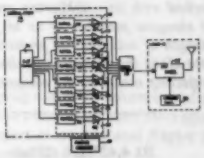
The patentability of claim **19** is confirmed.

Claims **2, 3, 5, 14** and **16** are cancelled.

Claims **1, 4, 6, 15, 20** and **22** are determined to be patentable as amended.

Claims **7–13, 17, 18, 21** and **23–25**, dependent on an amended claim, are determined to be patentable.

1. An amplifier for providing high fidelity amplification of an amplitude and frequency varying input signal, comprising:
means for providing said amplitude and frequency varying input signal;
means responsive to said signal for converting said signal into a plurality of pulse trains of like polarity and frequency, but differing in phase from one another by a fixed amount, with the pulses of each said pulse train having a characteristic which varies in a like manner with variations in said input signal; and,



means for combining said plurality of pulse trains into a composite signal of increased magnitude and of substantially the same waveform as said amplitude and frequency varying input signal whereby high fidelity amplification of said amplitude and frequency varying input signal is provided,
wherein said converting means comprises at least two pulse duration modulators, each responsive to a respective synchronizing signal and to said amplitude and frequency varying input signal for each providing a said pulse train comprising periodically occurring pulses having pulse widths modulated in accordance with said amplitude and frequency varying input signal, and means for providing said synchronizing signals to each of said pulse duration modulators for controlling the operation thereof so that said pulse trains provided by said modulators all have substantially the same pulse repetition rate but have different relative phases.

B1 4,343,124 (290th)
STRUCTURAL ELEMENTS

Friedrich C. Math, Farnham, England, assignor to The British Petroleum Company Limited, London, England

Reexamination Request No. 90/000,392, Jun. 10, 1983.
Reexamination Certificate for Patent No. 4,343,124, issued Aug. 10, 1982, Ser. No. 144,173, Apr. 25, 1980.
Claims priority, application United Kingdom, Apr. 26, 1979, 7914503
Int. Cl.³ E04C *3/10*
U.S. Cl. 52—226

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

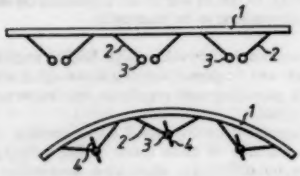
Claim **1** is cancelled.

Claims **2–4** and **6, 7** are determined to be patentable as amended.

Claim 5, dependent on an amended claim, is determined to be patentable.

New claim 8 is added and determined to be patentable.

8. A structural building element comprising a resilient linear elongate member of a fibre reinforced plastics material capable of



limited flexing into a curved shape on site, pairs of rigid projecting means located along and integral with said elongate member, said rigid projecting means having at its ends means adapted to interengage and be locked with its neighboring projecting means upon flexing of said elongate member so as to form a curved rigid structure, the length of each pair of projecting means being less than the distance along the elongate member between the joining points of the projecting means to the elongate member.

B1 4,427,126 (291st)
VENTED CLOSURE

Efrem M. Ostrowsky, Highland Park, Ill., assignor to Ethyl Products Company, Richmond, Va.

Reexamination Request No. 90/000,560, May 21, 1984.
Reexamination Certificate for Patent No. 4,427,126, issued Jan. 24, 1984, Ser. No. 271,776, Jun. 8, 1981.
Int. Cl.³ B65D *51/16*
U.S. Cl. 215—307

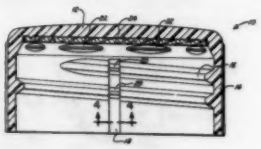
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.

Claims 2–4, dependent on an amended claim, are determined to be patentable.

New claims 5–7 are added and determined to be patentable.

1. In a thermoplastic closure suitable for fitment to a threaded container neck wherein the closure includes:
(a) a top wall,
(b) an annular sidewall downwardly depending from the top wall,
(c) a closure thread carried on the inside surface of the annular sidewall for cooperation with the container neck thread,



(d) a sealing system above the closure thread for effecting a gas-tight seal between the closure and the container, and
(e) at least one venting groove in the sidewall traversing the closure thread,
the improvement which comprises a rigidifying means at each point of traverse by said venting groove of said closure thread, said rigidifying means being dimensioned so that it has a perpendicular height measured from the inside surface of said sidewall less than the perpendicular height of said closure thread measured from the inside surface of said sidewall [.] *but having a perpendicular height sufficient to enhance the hoop strength of said annular sidewall,* whereby pressurized gas can pass through said venting groove to the atmosphere as said closure is removed from said container.

REISSUES

DECEMBER 25, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,775

METHOD AND AN APPARATUS FOR DISTRIBUTING A DISINTEGRATED MATERIAL ONTO A LAYER FORMING SURFACE

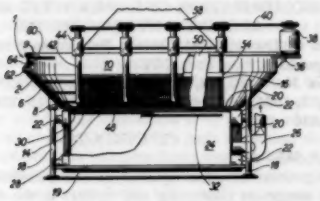
Torsten B. Persson, Maarslet, Denmark, assignor to Scan-Web I/S, Riskov, Denmark

Original No. 4,157,724, dated Jun. 12, 1979, Ser. No. 862,035, Dec. 19, 1977. Continuation of Ser. No. 717,384, Aug. 24, 1976, abandoned. Application for reissue Jun. 12, 1981, Ser. No. 273,040

Claims priority, application United Kingdom, Aug. 27, 1975, 35429/75

Int. Cl.³ B65B *1/14*

U.S. Cl. 141—1 **41 Claims**



35. Method for distributing and depositing loose fibers or particles onto a surface of a moving carrier web comprising the steps of:

(a) feeding loose fibers or particles into a distributor housing having an outlet positioned above a foraminous moving carrier web;

(b) creating a flow of said particles or fibers circulating within said housing and as a whole traveling across a screen means that is elongated in a direction substantially parallel the surface of the moving carrier web and positioned for screening a flow of said particles and fibers outwardly therethrough in said direction of elongation parallel to the surface of said carrier web, and applying outwardly directed forces to said transverse flow for creating said flow through said screen means; and

(c) drawing said fibers or particles, flowing outwardly through said screen means, onto said carrier web so as to be deposited in a layer thereon.

Re. 31,776

RESIN REINFORCED EXPANSION ANCHOR AND METHOD OF INSTALLATION

Carl A. Clark, Liverpool, and John Rogala, Syracuse, both of N.Y., assignors to The Eastern Company, Naugatuck, Conn.

Original No. 4,162,133, dated Jul. 24, 1979, Ser. No. 882,797, Mar. 2, 1978. Continuation-in-part of Ser. No. 835,367, Sep. 21, 1977, abandoned. Application for reissue Sep. 21, 1979, Ser. No. 77,770

Int. Cl.³ E21D *20/02*

U.S. Cl. 405—261 **41 Claims**

32. An expansion shell assembly for anchoring a bolt in a bore hole containing adhesive material comprising:

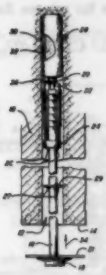
a camming plug threadably engaged to the end of the bolt for axial movement thereon;

an expandable shell having a plurality of longitudinally extending fingers spaced from one another by longitudinal slots;

said fingers each having an inner surface abutting said camming plug and an outer surface adapted to engage the wall of the bore hole;

releasable means securing said camming plug to the bolt for rotating the bolt in a first direction to facilitate mixing of the adhesive material in the bore hole; and

said releasable means being operable upon rotation of the bolt in a second direction to permit rotation of the bolt relative to said camming plug and effect advancement of said camming plug on the bolt to exert an outward force upon said inner surfaces of said fingers to expand said fingers in the bore hole and thereby tension the bolt.



Re. 31,777

FEEDING DEVICE FOR CIGARETTE FILTERS AND SIMILAR RODS

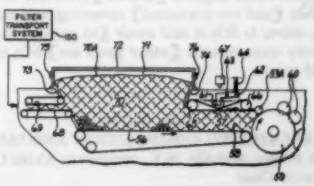
Walter Carascon; Derek H. Dyett, and Grantley R. Hoath, all of High Wycombe, England, assignors to Molins Ltd., London, England

Original No. 4,352,604, dated Oct. 5, 1982, Ser. No. 137,970, Apr. 7, 1980. Application for reissue Mar. 8, 1983, Ser. No. 473,208

Claims priority, application United Kingdom, Apr. 5, 1979, 7912043

Int. Cl.³ B65G *51/02, 37/00*

U.S. Cl. 406—28 **15 Claims**



15. In a cigarette filter attachment machine, means for feeding filter rods comprising a fluted drum for carrying filter rods in the flutes thereof; powered conveyor means arranged to feed a stack-like multi-layer stream of filter rods towards the fluted drum whereby movement of the conveyor means urges the filter rods towards the fluted drum to ensure that filter rods enter the flutes of the fluted drum, at least a part of said conveyor means being disposed at a level below the top of said fluted drum; means defining an expandable area for filter rods above the said part of said conveyor means disposed below the top of the fluted drum and including means upstream of said fluted drum for selectively supporting above the said expandable area a succession of filter-containing trays for feeding filter rods from the trays and onto the conveyor means; and pneumatic feed means for feeding pneumatically-delivered filter rods into the expandable area above the

conveyor means whereby the volume of the filter rods expands in the expandable area when the filter rods enter the expandable area from the feed means at a rate greater than that at which filter rods are conveyed from the expandable area by the conveyor means.

Re. 31,778

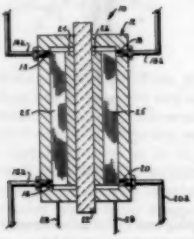
ELECTROCHEMICAL SEPARATION AND CONCENTRATION OF SULFUR CONTAINING GASES FROM GAS MIXTURES

Jack Winnick, 3028 Vinings Fy. Dr., Atlanta, Ga. 30339

Original No. 4,246,081, dated Jan. 20, 1981, Ser. No. 17,064, Mar. 2, 1979. Application for reissue Jul. 16, 1982, Ser. No. 398,748

Int. Cl.³ C25B *1/02*

U.S. Cl. 204—130 **5 Claims**



1. A method of removing [sulfur gases] SO_2 from a gas mixture at a temperature of about 150° C. or above, said method comprising the steps of:

providing an electrochemical cell having an inert *gas porous* cathode and an inert anode, *said cathode and anode being held in place in said cell by porous members*;

providing said cell with an electrolyte which is molten at temperatures above about 150° C. selected from the group comprising alkali metal sulfates, alkali metal bisulfates, and alkali metal pyrosulfates;

raising the temperature of said cell to at least 150° C. whereby said electrolyte is in its molten state;

[effecting] *providing an external source of electrical energy to effect* current flow between said cathode and said anode;

directing said gas mixture past said cathode where oxidation of [sulfur] SO_2 occurs and sulfur containing anions are formed which migrate [toward] *from said cathode to* said anode [and are converted] *converting said sulfur containing anions to* SO_3 *at said anode* [to gaseous species] SO_3, whereby concentrated [sulfur gases are] SO_3 *is* evolved at said anode.

Re. 31,779

GERM-KILLING COMPOSITION AND METHOD

Howard Alliger, Melville, N.Y., assignor to Alcide Corporation, Westport, Conn.

Original No. 4,084,747, dated Apr. 18, 1978, Ser. No. 670,674, Mar. 26, 1976. Application for reissue Apr. 17, 1980, Ser. No. 140,444

Int. Cl.³ A01N *3/00*

U.S. Cl. 252—187.23 **14 Claims**

1. Process for [the production of a composition having germicidal properties] *disinfecting a substrate* comprising contacting *said substrate with a composition comprising* sodium chlorite with a substantially water soluble acid material selected from the group consisting of organic acids and mixtures thereof with inorganic acid, said acid material comprising at least about 15% by weight of lactic acid, [and] wherein said contacting is carried out in aqueous media and in the presence of sufficient of said acid to lower the [PH] *pH* of said aqueous media to less than about 7.

Re. 31,780

MULTILAYER LIGHT-REFLECTING FILM

Scott A. Cooper, Yorktown Heights; Ramakrishna Shetty, White Plains, both of N.Y., and Jules Pinsky, Bloomfield, Conn., assignors to The Mearl Corporation, Ossining, N.Y.

Original No. 4,310,584, dated Jan. 12, 1982, Ser. No. 107,351, Dec. 26, 1979. Application for reissue Aug. 8, 1983, Ser. No. 521,127

Int. Cl.³ B32B *7/02, 27/06, 27/36*

U.S. Cl. 428—212 **11 Claims**

1. A transparent thermoplastic resinous laminate film of at least 10 very thin layers of substantially uniform thickness, said layers being generally parallel, the contiguous adjacent layers being of different transparent thermoplastic resinous materials one of which is a *terephthalate* thermoplastic polyester or copolyester resin having a refractive index of 1.55–1.61 and the adjacent resinous material having a refractive index which is lower by at least about 0.03, the contiguous adjacent layers differing in refractive index by at least about 0.03.

Re. 31,781

ISOMERIZATION OF MONOCYCLIC ALKYL AROMATIC HYDROCARBONS

Francis G. Dwyer, West Chester, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Original No. 4,100,214, dated Jul. 11, 1978, Ser. No. 684,512, May 7, 1976. Application for reissue Jul. 25, 1983, Ser. No. 516,830

Int. Cl.³ C07C *5/24*

U.S. Cl. 585—481 **15 Claims**

1. A process for effecting catalytic isomerization of xylenes which comprises contacting said xylenes in the vapor phase with hydrogen at a temperature of from about 450° to about 900° F., a pressure of from about 50 psig to about 500 psig, a hydrogen/hydrocarbon mole ratio of from about 0.1 to about 100 and a weight hourly space velocity of from about 0.1 to about 200 in the presence of from about 3 to about 30 combined weight percent, based upon weight of the xylene feed, of diluent of toluene and C_9+ recycle material and a crystalline aluminosilicate zeolite characterized by a silica/alumina mole ratio of greater than 12 and a constraint index within the approximate range of 1 to 12 and containing cations which are selected from the group consisting of iron, nickel and cobalt.

11. The process of claim 1 wherein said zeolite is combined in an amount from about 30 to about 90 weight percent with a calcined α-alumina monohydrate binder.

Re. 31,782

XYLENE ISOMERIZATION

David H. Olson, Pennington, and Werner O. Haag, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Original No. 4,159,282, dated Jun. 26, 1979, Ser. No. 913,999, Jun. 9, 1978. Application for reissue Jan. 20, 1984, Ser. No. 572,784

Int. Cl.³ C07C *5/24*

U.S. Cl. 585—481 **21 Claims**

1. A process for isomerizing an isomerization feed containing an aromatic C_8 mixture of ethylbenzene and xylene, in which the para-xylene content is less than equilibrium which comprises contacting said feed, under conversion conditions, with a catalyst comprising a crystalline aluminosilicate zeolite having a crystal size of at least about 1 micron, a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12 to yield an isomerization product characterized by a reduced ethylbenzene content and an enhanced para-xylene content.

14. A process according to any of claims 1 to 13 comprising a further isomerization conversion step wherein the isomerization feed is subsequently contacted with a small crystal aluminosilicate zeolite having a crystal size less than about 1 micron.

PLANT PATENTS

GRANTED DECEMBER 25, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,376

ROSE PLANT

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Mar. 25, 1983, Ser. No. 461,985
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers of yellow and orange, being yellow on center portion of flower with outer band of orange to orange red, the bud being pointed in the early opening stage, resembling in form Lemon Delight — miniature — U.S. Plant Pat. No. 4,447, with the full open flower being flat to slightly cupped, with 18 or more petals; and further characterized by a plant of compact, vigorous, well rounded shape, with main stems and shoots of average thorniness, the said plant being easy to propagate from soft wood cuttings, with an abundance of small semi-glossy to matt foliage, the flowers being born singly or several to the stem in clusters.

5,377

ALMOND TREE (PEARL)

Robert H. Schmidt, 13500 Tim Bell Rd., Waterford, Calif. 95386

Filed Jul. 21, 1983, Ser. No. 515,859
Int. Cl.[3] A01H 5/03
U.S. Cl. Plt.—30 1 Claim

1. A new and distinct variety of almond tree, substantially as illustrated and described, characterized in particular by early tree maturity, heavy blooming and being interfruitful with the Nonpareil, harvesting with the Thompson, Merced, and Ruby, and by heavy bearing of medium-size, well-sealed nuts having medium-size, ovate, plump kernels, and a medium to high percentage of kernel to nut.

5,378

NERIUM OLEANDER PLANT—TURNER'S SHARI D

Ted L. Turner, Sr., 6503 S. Padre Island Dr., Corpus Christi, Tex. 78412

Filed May 25, 1983, Ser. No. 498,113
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—54 1 Claim

1. A new and distinct variety of *Nerium oleander* substantially as shown and described, having an upright habit of fairly rapid growth making it especially suitable as a screening plant, having an ability to be asexually reproduced, having the ability to flower off and on throughout the entire year, and being particularly characterized by the unique color of its inflorescence, the flowers being a pale buff yellow color with tinges of pink.

5,379

DISTINCT VARIETY OF STREPTOCARPUS NAMED FANTASIE

Herbert Kaiser, Rieskirchen, Fed. Rep. of Germany, assignor to Oglevee Associates, Inc., Connellsville, Pa.

Filed May 13, 1983, Ser. No. 494,379
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of Streptocarpus, substantially as herein shown and described.

PATENTS

GRANTED DEC. 25, 1984

ERRATA

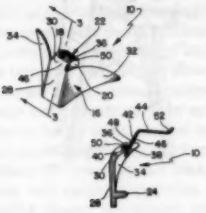
For CLASS	See PATENT NO.
122–032	4,489,788
521–053	4,489,913
238–003	4,489,958
384–428	4,489,991
384–496	4,489,992
351–211	4,490,002
351–226	4,490,023
424–312	4,490,414
337–372	4,490,704

PATENTS

GRANTED DECEMBER 25, 1984

GENERAL AND MECHANICAL

4,489,443
FORM FOR READY-MADE NECKTIE
Roger E. Ellin, Barrington, R.I., assignor to Royal Diversified Products, Warren, R.I.
Filed Aug. 15, 1983, Ser. No. 523,713
Int. Cl.³ A41D *25/08*
U.S. Cl. 2—153 **2 Claims**



1. A form for a ready-made necktie and the like comprising:
a. a form body having a central portion with front and rear sides and a pair of wings which extend outwardly and rearwardly from opposite side edges of said central portion;
b. an arm which extends rearwardly from said central portion adjacent the upper end thereof;
c. a shaft attached to said arm in rearwardly spaced relation to said central portion, said shaft having two substantially flat inner surfaces, which are disposed in angular relation to define a generally V-shaped sectional configuration of said shaft;
d. a pin extending rearwardly from said central portion, said pin being spaced downwardly from said arm and said shaft;
e. an elongated clamping member having first and second ends, said clamping member having an integrally struck resilient tongue at said first end thereof and being received on said shaft so that said tongue is in resiliently biased engagement therewith and so that said clamping member is pivotable between an open position wherein it extends generally rearwardly from said body and a closed position thereof wherein it is in engagement with said pin, said tongue engaging one of said shaft flat inner surfaces when said clamping member is in the open position thereof and engaging the other of said shaft flat inner surfaces when said clamping member is in the closed position thereof.

4,489,444
GOLF BALL MARKER HOLDER
James E. Graham, 2799 Delk Rd., Marietta, Ga. 30067
Filed Dec. 6, 1982, Ser. No. 433,435
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—160 **6 Claims**

1. A holder for holding a golf ball position marker having a disc-shaped base from one side of which a spike projects, and with said holder comprising a pad permanently joined with a flap such that the flap may be removably positioned upon said pad, and with confrontable surfaces of said pad and flap being respectively formed of fibrous materials that interlock so as to releasibly grip one another, and with said flap having an aperture of a size and shape such that the spike of the golf ball position marker when seated upon the pad may extend there-

through once the flap is placed upon the pad but the marker base may not be passed therethrough.

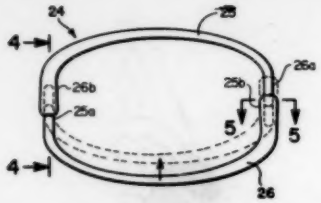
4,489,445
METHOD AND CONSTRUCTION OF UNITARY WELT AND FLAP FOR A POCKET OPENING
John B. Reece, 54 Fairgreen Pl., Chestnut Hill, Mass. 02167
Filed Dec. 27, 1983, Ser. No. 565,594
Int. Cl.³ A41D *17/02, 27/20*
U.S. Cl. 2—247 **10 Claims**

1. A flap covered pocket opening for a garment comprising,
a main garment panel having an opening formed therein,
the edges of said opening being turned back upon the reverse side of said pocket opening,
said opening being covered by welting material extending across said opening,
said welting material having at least one folded edge lying within the said opening,
said welting material being secured to the reversed edges of said opening,
said opening being covered by a piece of material which forms a flap extending across said opening,
said flap material being secured to a reversed edge of said opening and extending over the welting material secured to the opposite edge of said opening and,
said flap material and said welting material being integral with each other.

4,489,446
HEART VALVE PROSTHESIS
Charles C. Reed, 5934 Hornwood, Houston, Tex. 77071
Filed Jul. 14, 1982, Ser. No. 398,084
Int. Cl.³ A61F *1/22*
U.S. Cl. 3—1.5 **14 Claims**

1. An atrioventricular annuloplasty prosthesis for use in repairing the annulus of a natural heart valve, comprising:
first means for providing a flexible, biocompatible material which may be sutured onto the annulus of a natural heart valve; and
second means for stiffening essentially the entire circumference of said first means said second means being essen-

tially rigid and having a generally oval-shaped configuration which substantially conforms to the shape of a normal heart valve annulus, and said stiffening means comprising two stiffener members secured together so as to allow reciprocating movement therebetween for permitting substantially rectilinear adjustment of the shape thereof at



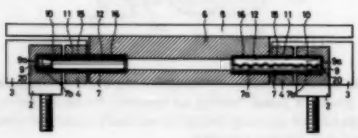
longitudinal ends of said oval configuration substantially adjacent to the positions where adjacent heart valve leaflets connect with the valve annulus so that rectilinear adjustment of the shape of the second means will cause the valve annulus of a natural heart valve to which the prosthesis is secured to be conformed to a suitable shape for acceptable operation of said natural heart valve.

4,489,447

TOILET BOWL

Yozaburo Umehara, 2-8-6, Shakujiimachi, Nerima-ku, Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 426,101
Claims priority, application Japan, Jun. 10, 1981, 56-159195; Jun. 23, 1982, 57-108152
Int. Cl.³ A47K *13/12*
U.S. Cl. 4—240 **7 Claims**



1. A hinged toilet seat and lid arrangement for a toilet bowl comprising:

a pair of stationary members adapted to be mounted on said toilet bowl in a spaced apart relationship, each stationary member being formed with a blind bore opening toward the other member and lying in axial alignment with the blind bore thereof, a pair of lugs extending between said stationary members from said toilet seat, each lug being formed with a throughgoing bore lying in axial alignment with said blind bores, a formation extending between said lugs from said lid and formed with a throughgoing bore lying in axial alignment with the bores of said lugs;

a pair of spring pins, each spring pin being seated in one of said respective stationary members and extending through one of said lugs into said formation, each of said spring pins being formed as an elongated thin wall cylindrical sleeve of uniform cross section and wall thickness, said spring pin being further formed with a generally axial slit in the wall thereof extending the length of said sleeve; and

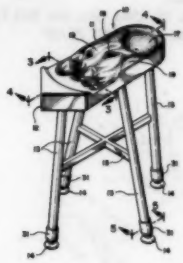
respective frustoconical wedges driven into one end of each of said spring pins for expanding same to fix the respective end within a respective blind bore and to provide rotational resistance with respect to said throughgoing bores such as to permit pivoting of said seat and said lid about said pins and to maintain said seat and said lid in any desired position of rotation about said pins.

4,489,448

FOOT SUPPORT FOR SHOWERS

John B. Cairo, 1890 Alla Panna Way, Sandy, Utah 84092

Filed May 10, 1983, Ser. No. 493,283
Int. Cl.³ A47K *3/022*
U.S. Cl. 4—574 **9 Claims**



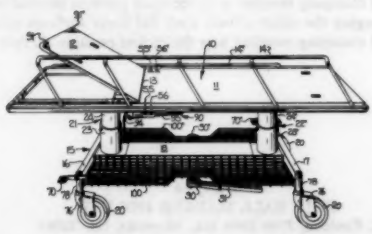
1. A foot support for supporting a foot above ground level, comprising a foot supporting platform having indentations in the shape of a partially superimposed left and right human footprint, the platform indentations including an indentation at one end defining a heel rest to hold the heel in place when weight is concentrated on the heel and the remainder of the foot is raised, thereby allowing the toes to move freely, toe-receiving indentations at the end opposite said one end for holding the toes in place when weight is concentrated on the toes and the heel is raised, said toe receiving indentations including an array of indentations to receive individual toes of either foot, and a longitudinal groove located between said one end and said opposite end for supporting a longitudinal margin of the foot when weight is concentrated on such longitudinal margin; and means for supporting the platform at a height convenient for receiving a foot of a bather raised for foot-washing or similar purposes.

4,489,449

TRAUMA CARE WHEELED STRETCHER

Raymond A. Failor, Chippewa Lake, and Otto Z. Kabdebo, Medina, both of Ohio, assignors to Simmons Universal Corporation, New York, N.Y.

Filed Feb. 6, 1981, Ser. No. 232,120
Int. Cl.³ A61G *7/10*
U.S. Cl. 5—86 **4 Claims**



1. A trauma care stretcher including an undercarriage structure including head and foot ends and opposite sides, a wheel supported at each corner of said undercarriage, brake means associated with each of said wheels, a rectangular patient supporting platform, hydraulic means fixed on said undercarriage and supporting said patient supporting platform for vertical movement relative to said undercarriage, said patient supporting platform comprising a fixed body supporting portion and a backrest pivotally connected at one end to said body

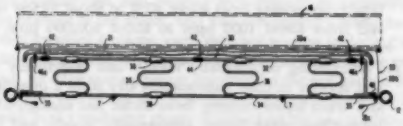
supporting portion, position control means connected to said backrest and being operable to maintain said backrest in adjusted position and to assist in changing the position of said backrest, said position control means comprises a gas spring fixed at one end to said fixed body supporting portion of said patient supporting platform and operatively connected at the other end to said backrest portion, manually operable means positioned at each side of said backrest for actuating said position control means so that an attendant positioned at either side of said stretcher may vary the adjusted position of said backrest, said manually operable means comprising pull handles at each side of said backrest, said pull handles being operatively connected to said gas spring to permit adjustment of said gas spring when depressed, foot pedal hydraulic pumping means carried by and positioned at each side of said undercarriage for operation by an attendant to raise said patient supporting platform, a foot operated brake control positioned at each side of said undercarriage and being operable by an attendant to apply said brake means to said wheels, control means positioned at each side of said patient supporting platform and being operable by an attendant for lowering and tilting said patient supporting platform, said patient supporting platform lowering and tilting control means comprising pushbutton controls positioned at each side of said patient supporting platform, and valve means operable by said pushbuttons for selectively lowering either of said hydraulic cylinders at said head and foot ends of said undercarriage, said valve means also being operable by said pushbuttons for simultaneously lowering both of said hydraulic cylinders at said head and foot ends of said undercarriage, whereby an attendant at either side of said stretcher may continuously monitor a patient while operating said backrest, said hydraulic pumping means, said brake control, and said patient supporting platform lowering and tilting control means.

4,489,450

BODY SUPPORT FOR BED OR SEAT

John E. Miller, Tupelo, Miss., assignor to Parma Corporation, Denton, N.C.

Filed Apr. 13, 1982, Ser. No. 367,874
Int. Cl.³ A47C 23/02
U.S. Cl. 5—250 **45 Claims**



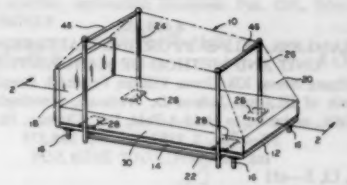
1. A body support for use in a bed or seat, the body support including a case, a plurality of resilient support members received in the case and being movable between a retracted inoperative uncompressed position and an erect operative position for supporting a body, and actuating means for moving said resilient members from said erect position to said retracted position and from said retracted position to said erect position, and wherein said case has an upper portion movable by said resilient members to an upper position when the resilient members are moved to their erect position and movable to a lower position when the resilient members are moved to their retracted position, wherein said actuating means includes means interconnecting a plurality of said resilient supports for transmitting movement therebetween.

4,489,451

SHEET TENT

Morrell Neely, 9011 S. Paxton, Chicago, Ill. 60617

Filed Sep. 23, 1982, Ser. No. 422,074
Int. Cl.³ A47C 29/00
U.S. Cl. 5—414 **5 Claims**



1. A sheet tent, for use with a bed supported by a support surface, having a head and foot comprising:

(a) a sheet including a plurality of holes therein;

(b) vertically extending posts disposed adjacent said bed for supporting said sheet, said posts extending at one end thereof to said supporting surface;

(c) fastening means extending through the holes defined by the sheet and being adopted to be attached to the tops of each of said posts;

(d) means for removably fastening the sheet to the foot of the bed;

(e) a means for removably fastening the sheet to the head of the bed, whereby the sides of said sheet hang loosely over the sides of said bed, and said sheet is supported at a distance over said bed;

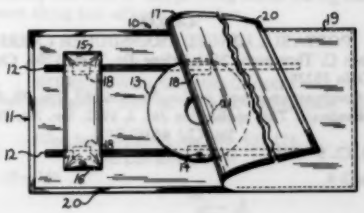
said bed including a mattress and a horizontal surface to support the mattress, and wherein said posts each include a plate attached thereto and extending between said mattress and said horizontal surface to thereby additionally support said posts in a substantially vertical position.

4,489,452

PRENATAL MATTRESS

Jodey J. Lickert, 8964 Whitewood, Temperance, Mich. 48182

Continuation-in-part of Ser. No. 303,536, Sep. 18, 1981, Pat. No. 4,382,306. This application Sep. 27, 1982, Ser. No. 424,749
The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.
Int. Cl.³ A47C 27/08; A47G 9/00
U.S. Cl. 5—465 **12 Claims**



1. A prenatal mattress, especially for supporting the abdomen and other portions of the body of a pregnant user lying frontally-downwardly thereupon, comprising:

(a) a layer of flexible material having substantially planar upper and lower surfaces;

(b) a substantially resilient cushion, said cushion being of one-piece construction, having a substantially centrally-located hole and being capable of being detachably joined to said layer in a predetermined position and of such a shape that said cushion provides support for the abdomen of the user;

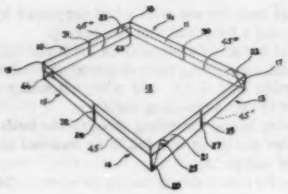
(c) releasable fastening means carried by said layer for detachably joining said cushion to said layer so that said cushion is fixed in the predetermined position; and a second layer of flexible material, said first named and second layers being of substantially the same size and shape, and being adapted to be attached to each other, thereby fixing said resilient cushion in the predetermined position.

4,489,453

SEAMLESS, SELF-SUPPORTING WATERBED LINER UNIT AND METHOD OF MANUFACTURE

Wolfgang Blass, Elk Grove Village; Friedrich Bergl, Chicago, both of Ill., and Judson D. Wetmore, Huntington Beach, Calif., assignors to Hold-A-Fold, Inc., Chicago, Ill.

Filed Jun. 2, 1982, Ser. No. 384,373
Int. Cl.³ A47C *27/08*; B65D *5/36*
U.S. Cl. 5—451 **7 Claims**



1. An improved, seamless waterbed safety liner assembly comprising:

(a) a continuous sheet of plastic having a floor area defined centrally thereof,

(b) upstanding perimetral walls along the margins of said floor area and defining therebetween an interior volume for receiving a waterbed mattress,

(c) said upstanding perimetral walls comprising a plurality of strips of rigid sheet material risers having an inner face facing said floor area, an outer face, and a top edge, and margins of said plastic sheet being draped up the sides of said inner face, over said top edge and overlapping a limited portion of the outside face of said risers,

(d) said plastic sheet being secured to said risers, and

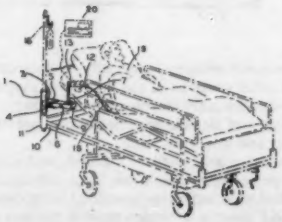
(e) seamless corners formed in said sheet including at least one z-fold triangular hospital corner having a tip, said z-fold sheet corner being disposed interiorly with respect to said interior face of said riser, and said tip being disposed as part of said overlap along the exterior face of said riser.

4,489,454

PORTABLE HINGED TRANSDUCER CARRIER

James C. Thompson, 2671 Erlene Dr., Apt. 1704, Cincinnati, Ohio 45238

Continuation-in-part of Ser. No. 116,553, Jan. 29, 1980, abandoned. This application Jul. 2, 1982, Ser. No. 394,776
Int. Cl.³ A61G *7/06*
U.S. Cl. 5—503 **3 Claims**



1. Apparatus for carrying a hemodynamic pressure transducer in a hospital bed so that the transducer is maintained in a constant relationship with the level of the heart of a patient in said bed, comprising:

(a) a first, vertical member for mounting said apparatus into a bracket provided on a hospital bed, said member being adapted to hold an intravenous feeding pole in an opening in its upper end;

(b) hinge means attached to and projecting horizontally from said first vertical member;

(c) a second member engaging said hinge means and disposed to project in a direction perpendicular to the axis of said first member; and

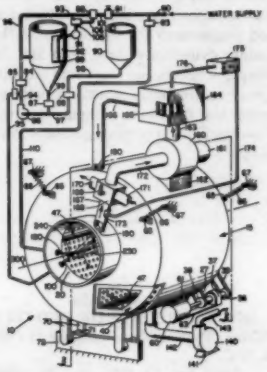
(d) a third, vertical member to which a hemodynamic pressure transducer may be affixed.

4,489,455

METHOD FOR HIGHLY EFFICIENT LAUNDERING OF TEXTILES

Wolfgang U. Spendel, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 436,169, Oct. 28, 1982, , which is a continuation-in-part of Ser. No. 320,155, Nov. 10, 1981, abandoned. This application Nov. 5, 1983, Ser. No. 548,265
Int. Cl.³ D06F *23/02*, *25/00*, *39/08*
U.S. Cl. 8—158 **29 Claims**



1. A process for laundering a discrete wash load of assorted soiled textiles comprising the steps of:

(a) producing a quantity of concentrated aqueous wash liquor comprising from about 40% to about 99.9% water and from about 1000 ppm to about 600,000 ppm of a detergent composition;

(b) distributing substantially evenly and completely onto said textiles in their substantially dry state a quantity of said wash liquor ranging from about just enough to distribute said wash liquor substantially evenly and completely onto said textiles to a quantity of said wash liquor which is about 5 times the dry weight of the textiles, said wash liquor containing from about 5 grams to about 200 grams of said detergent composition per kilogram of said textiles;

(c) allowing said wash liquor to remain in contact with said soiled textiles for a period of time during which, if there is more than a minimal amount of free liquor in excess of the absorption capacity of said textiles, only limited amounts of mechanical energy are applied to said textiles so as to prevent oversudsing;

(d) rinsing said textiles with a quantity of an aqueous liquid, rinse liquor sufficient to produce enough free water on the surface of said textiles to adequately suspend the soil and the detergent composition; and

(e) separating said rinse liquor containing said wash liquor and said soil from said textiles.

4,489,456

TOOL FOR MAKING RIVET OR EXPANSION NAILS

Lars J. T. Billing, Vermlandsgatan 2, Helsingborg, Sweden

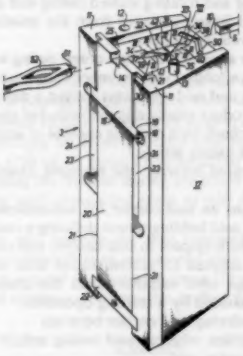
PCT No. PCT/SE81/00382, § 371 Date Sep. 10, 1982, § 102(e) Date Sep. 10, 1982, PCT Pub. No. WO82/02504, PCT Pub. Date Aug. 5, 1982

PCT Filed Dec. 18, 1981, Ser. No. 422,902

Claims priority, application Sweden, Jan. 23, 1981, 8100395

Int. Cl.³ B21G 3/08, 3/18, 3/24

U.S. Cl. 10—43 10 Claims



1. A tool for making rivet or expandible nails having a pointed end and a shank portion positioned adjacent to said pointed end and being parted into two outwardly bulging legs spaced apart at the place of maximum bulge with the legs reuniting integrally on each side of the bulging and terminating in said pointed end, said bulging legs defining an expandible eyelet opening in the shank, said tool comprising a frame having two mandrel sections, each mandrel section including an end surface, a guide for the nail positioned adjacent to the end surface, an edge cutting means mounted on the end surface for cutting one end of the nail in V-fashion to shape the point of the nail, eyelet stamping means mounted on the end surface, a resilient applicator positioned adjacent to the end surface and a spring means slidably supporting the resilient applicator and adapted to press the nail during a working stroke in a direction opposite to the working direction of the mandrel sections and to lift the nail from the edge cutting means and eyelet stamping means during the return stroke of the mandrel sections wherein the guide, edge cutting means, eyelet stamping means and resilient applicator are positioned with respect to each mandrel section opposite to each other and are adapted during the working stroke to be brought to bear around the nail and at the end of the working stroke the edge cutting means and the eyelet stamping means are moved toward the respective edge cutting means and eyelet stamping means on the opposed mandrel to effect cutting the nail and stamping the expandible eyelet opening defined by the nail.

4,489,457

HEIGHT ADJUSTMENT MEANS FOR A CYLINDRICAL BRUSH IN A CARPET SWEEPER

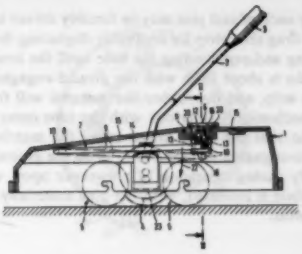
Helmut Deimel, and Rolf G. Schülein, both of Singhofen, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Nov. 29, 1983, Ser. No. 555,914

Claims priority, application European Pat. Off., Mar. 21, 1983, 83102762.8

Int. Cl.³ A47L 11/33

U.S. Cl. 15—41 R 5 Claims



1. In a carpet sweeper of the type including a housing, means for supporting said housing for movement on a surface to be cleaned and means for moving said housing, the combination comprising:

cylindrical brush means; and

means for mounting said brush means on the housing for adjustment of the spacing thereof from the surface to be cleaned including

an adjusting member having two free ends and holding said cylindrical brush means in said housing for rotation about an axis,

supporting parts each extending from one of said ends of said member at an angle relative thereto and being pivotally mounted in said housing,

an adjusting element slidably mounted on said housing,

means for pivoting said adjusting member about said supporting parts, said means having two ends, each of which is slidably mounted on said member, and a section between said ends which is connected to said adjusting element,

inclined portions on the interior surface of said housing for guiding said ends of said pivoting means during movement along said adjusting member.

4,489,458

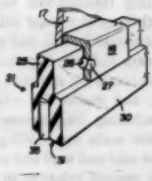
STREET SWEEPER DRAG SHOE

Warren M. Schwayder, 2335 E. Lincoln, Birmingham, Mich. 48008

Filed Sep. 29, 1983, Ser. No. 537,171

Int. Cl.³ E01H 1/04

U.S. Cl. 15—246 9 Claims



9. Street sweeper drag shoe wear pins for forcible insertion into vertically elongated holes, which are cross-sectionally

undersized relative to the pin-cross-sectional dimensions, formed in the bottom, ground-engaging surface of horizontally elongated, rubber-like drag shoe strips, said pins each comprising:

a thin wall, steel tube having an open lower end, a filler matrix formed of closely packed, hard metal, cemented carbide particles embedded within a soft, heat conductive, metal binder made of a cuperous material, with the matrix being exposed at the open, lower end of the tube;

with the outer wall surface of said tube having irregularities formed thereon, such as knurling, threads and corrugations;

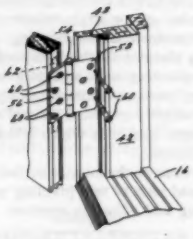
whereby each of said pins may be forcibly driven into a hole in the drag shoe strip for resiliently displacing the material defining and surrounding the hole until the lower end of the tube is about flush with the ground-engaging surface of the strip, and the rubber-like material will frictionally and mechanically interlock with the tube outer wall surface so that the tube lower edge, the matrix and the ground-engaging surface all rub along the ground simultaneously during operation of a sweeper upon which the drag shoe is mounted, with the pins materially reducing shoe wear.

4,489,459

ADJUSTABLE HINGE CONSTRUCTION INCLUDING SPRING CLIPS FOR PREFAB DOOR AND JAMB ASSEMBLIES

John J. Kempel, West Branch, Mich., assignor to Garland Manufacturing Co., West Branch, Mich.

Filed Jul. 20, 1983, Ser. No. 515,624
Int. Cl.³ E05D 7/04
U.S. Cl. 16—248 **15 Claims**



1. An assembly for adjustably securing a door to a hinge means having at least one fastener means adapted for securing said hinge means to said door comprising:

hinge stile means having side walls and an end wall, said end wall defining an enlarged aperture registerable with said fastener means, said enlarged aperture having substantially greater cross sectional area than said fastener means thereby permitting translational movement of said fastener means with respect to said stile means,

means defining a channel in said end wall,

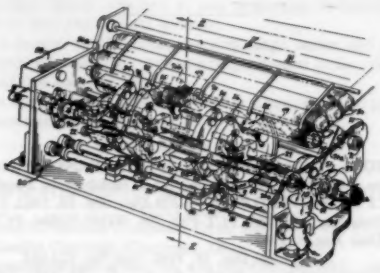
clamping plate means slidably disposed within said channel having a fastener receiving aperture of engaging with said fastener means, and means for retaining said clamping plate means including clip means frictionally secured between said side walls for holding said clamping plate generally against said end wall and stop means disposed in said channel in spaced relation to said clamping plate means for limiting sliding movement of said clamping plate means within said channel.

4,489,460

STUFFING METHOD AND APPARATUS

Joseph A. Nausedas, Oak Forest, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 31, 1983, Ser. No. 481,031
Int. Cl.³ A22C 11/02
U.S. Cl. 17—49 **38 Claims**



29. In a stuffing apparatus for producing linked sausages such as frankfurters, said stuffing apparatus having a rotatable chuch for engaging and rotating stuffed casing and a linker for forming individual linked sausages from the rotating stuffed casing, the improvement comprising:

(a) apparatus for accommodating a cored casing article, said article having a tubular core member carrying a supply of shirred casing and said apparatus having a discharge outlet for food product axially aligned with, but spaced from, the rotatable chuck by a distance capable of accommodating said cored casing article;

(b) a carrier located between the rotatable chuck and discharge outlet,

(c) holding means on said carrier for accommodating said casing article, said holding means defining a casing article axis position with respect to said carrier, and said holding means being adapted to accommodate both said casing article and said core member when the casing carried thereby is exhausted by a stuffing operation;

(d) means for indexing said carrier between

(i) a load position wherein said casing article is loaded onto said carrier, and

(ii) a stuff position wherein the core of said casing article is axially aligned with said discharge outlet and said rotatable chuck;

(e) engagement means adapted to reduce the distance between said discharge outlet and rotatable chuck for engaging a cored casing article held on said carrier and communicating one end of the tubular core thereof with said discharge outlet;

(f) drive means adapted to drivingly engage and rotate the tubular core of said cored casing article when said article is in said stuff position; and

(g) seal means at said discharge outlet for establishing an emulsion seal between said discharge outlet and the end of said tubular core communicated to said discharge outlet.

4,489,461

METHOD AND APPARATUS FOR TEXTILE FIBER DRAFTING

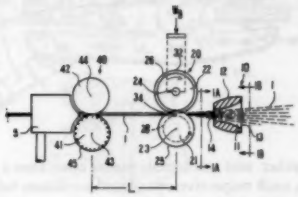
Junzo Hasegawa, Oobu; Susumu Kawabata, Aichi; Mitsunori Horiuchi, Kariya, and Yoshihisa Suzuki, Chiryu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Oct. 19, 1982, Ser. No. 435,265
Claims priority, application Japan, Oct. 24, 1981, 56-170472
Int. Cl.³ D01H 5/74
U.S. Cl. 19—258 **12 Claims**

1. Method of drafting textile fibers of sliver, roving or the like in a drafting apparatus including at least two pairs of

drafting rollers, the first pair of which comprises rollers supported rotatably on their respective axes parallel to each other and driven positively in opposite directions of rotation to feed said fibers forwardly in said drafting apparatus, and the second pair of which comprises rollers spaced downstream from said first pair of rollers, mounted rotatably on their respective axes parallel to each other and driven positively in the same direction of rotation as the counterparts of said first pair but at a peripheral speed which is set higher than that of said first pair, said first and second pairs of rollers providing one and the other nips for the sliver to be drafted and thereby forming a fiber drafting zone therebetween, said method comprising:

feeding the sliver to said first pair of rollers while rotating the same;



pressing said sliver by and between the rotating rollers of said first pair using compressive force within the range of from about 10 kg to about 50 kg so as to compact the sliver for reducing its cross-sectional area to from about ½ to about 1/50 of its initial cross-sectional area and thereby increasing the friction among the fibers of said sliver, and feeding such compacted sliver to said second pair of rollers;

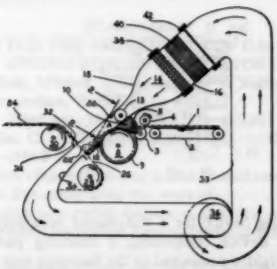
receiving and holding the thus compacted sliver by and between the rollers of said second pair while rotating the same at a speed of at least ten times (10×) that of said first pair of rollers to feed out the drafted fibers therefrom.

4,489,462

AIR FLOW CONTROL APPARATUS FOR A FIBER AIR-LAY MACHINE

William C. Dodson, Jr., Nashville, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 17, 1983, Ser. No. 476,424
Int. Cl.³ D01G *25/00*
U.S. Cl. 19—306 **3 Claims**



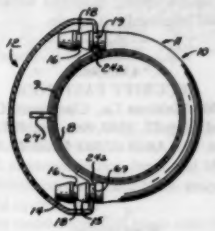
1. In an air-laydown apparatus having duct means for conveying fibers in a flow of air, fiber disperser means for projecting fibers into the duct means to form a stream of fibers in air, an air supply for directing a flow of air through the duct means and a moving condenser screen for collecting the fibers thereon to form a web, the improvement comprising: air-flow control means located in said duct means upstream of said fiber disperser means, for deflecting the flow of air at a continuously varying angle of deflection.

4,489,463

PIPE CLAMP

Gunter Schafer, Frankfurt, Fed. Rep. of Germany, assignor to Security Lumber & Supply Co., Bradley, Ill.

Filed Mar. 24, 1983, Ser. No. 478,259
Int. Cl.³ B65D *63/02*
U.S. Cl. 24—277 **6 Claims**



1. A pipe clamp comprising:

a U-bolt of predetermined radius of curvature and inside radius, said U-bolt having legs each of which is provided with first and second tandemly arranged frustoconical circumferential ribs with planar annular bases that define the distal margins of first and second circumferential grooves in said U-bolt legs;

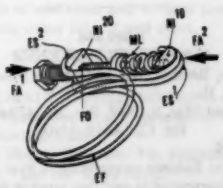
and a C-shaped sheet metal saddle of said predetermined radius of curvature and inside radius, said saddle having a hollow body portion with inside edges that are separated by a space less than the maximum width of said body portion, and said saddle having extremities each of which is provided with a circumferential slit rendering said extremities resilient, and each of said extremities having inturned end portions forming aligned transverse internal flanges with opposed inner margins that define split circular openings which are dimensioned to permit said flanges to snap around said circumferential ribs and engage in said grooves by reason of the resilience of said extremities, said U-bolt and saddle being adapted to loosely encircle a pipe when the flanges are engaged in said first grooves, and being adapted to firmly clamp said pipe when said flanges are engaged in said second grooves.

4,489,464

U-PROFILED IMPROVED HOSE CLAMP

Renzo Massari, and Sergio Massari, both of Via Padova, 217, 20127 Milan, Italy

Filed Jul. 7, 1982, Ser. No. 396,071
Int. Cl.³ B65D *63/00*; F16L *33/04*
U.S. Cl. 24—279 **1 Claim**



1. In a self-tightening encircling clamp, the combination of a body portion forming a closed loop of relatively stiff spring-like resilient wire, said wire loop being flattened to bring its

two opposite sides into a parallel spaced relationship, said sides being rolled into a circle of substantially less diameter than the outside diameter of the smallest hose upon which the clamp is to be used, a first extremity of said loop configuration being bent to form a U-shaped loop and the second extremity being bent to form a U-shaped profile; a screw-shaped adjusting means to increase or decrease the size of said loop structure, said screw presenting a tapered terminal portion, an intermediary nipple presenting on its front side a blind hole and formed to receive on the side opposite said front side a centering finger; said screw being screwed to said first nipple and cooperating with said tapered terminal portion and with said intermediary nipple; and a spring mounted between said second extremity and said intermediary nipple.

4,489,465

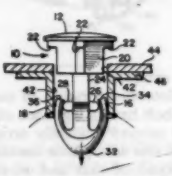
SECURITY FASTENER

Jack Lemkin, 5900 Mohican La., Cincinnati, Ohio 45243

Filed May 27, 1983, Ser. No. 498,725

Int. Cl.³ A44B *17/00*; F16B *13/04*

U.S. Cl. 24—289 **7 Claims**



1. A plastic security fastener adapted to secure together elements having apertures defined therein, said fastener being integrally molded from a flexible yet resilient plastic, said fastener comprising:

(a) an enlarged head,

(b) a shank depending below said head,

(c) said shank consisting of an upper segment and a solid stem,

(d) a plurality of shoulders formed on the upper segment,

(e) a pair of wings normally extending upwardly and angularly outwardly from the lower end of said stem,

(f) laterally projecting stop means defined on said stem,

(g) the upper ends of said wings projecting above a horizontal plane passing through said stop means,

(h) said wings being flexed inwardly until they engage said stop means as the fastener is inserted into the apertures in said elements,

(i) and the upper ends of said wings being rolled about said stop means as the fastener is advanced further into the apertures,

(j) the engagement of said shoulders with the elements being joined together defining the limit of the insertion of the fastener,

(k) said wings then flexing resiliently outwardly to return to their normal, unstressed position which locks the fastener within the apertures in the elements.

4,489,466

SUSPENDER FASTENER

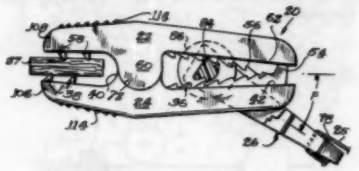
John A. Bakker, Bartlett, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 9, 1983, Ser. No. 473,485

Int. Cl.³ A44B *21/00*

U.S. Cl. 24—489 **4 Claims**

1. A suspender fastener comprising: a first lever; a second lever pivotally connected to said first lever in a manner so as to form a fulcrum therebetween, said first and second levers having a first pair of mutually proximate end portions longitudinally spaced from said fulcrum, at least one of said first and second levers having garment-engageable means thereon at said first pair of end portions for securing a garment thereto; said garment-engageable means comprises a plurality of teeth, each respective one of said plurality of teeth being disposed toward the other one of said first and second levers; each respective one of said plurality of teeth being further disposed toward said fulcrum; and a ratchet, said first and second levers having a second pair of mutually proximate end portions longitudinally spaced in distal relation to said first pair of end portions, at least one of said first and second levers having ratchetable means thereon at said second pair of end portions engageable by said ratchet for variably urging said second pair of end portions apart thereby variably urging said first pair of end



portions together; said ratchetable means comprises a plurality of serrations, each respective one of said serrations being laterally spaced relatively farther from the other one of said first and second levers than an adjacent one of said serrations which is longitudinally spaced relatively farther from said fulcrum than said one of said serrations; and said ratchet comprises rotatable-catch means for engaging at least one of said plurality of serrations, rotation of said rotatable-catch means through a predetermined angle about an axis transversely disposed intermediate said first and second levers thereby causing said catch means to disengage from at least one of said plurality of serrations and to engage said adjacent one of said serrations for progressively urging said first pair of end portions together.

4,489,467

MOUNTING DEVICE FOR A ROD-SHAPED PROXIMITY SWITCH

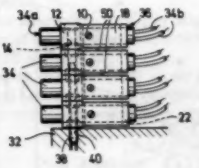
Peter Kroll, Neuenhaus, Fed. Rep. of Germany, assignor to Gebhard Balluff Fabrik GmbH & Co., Neuhausen, Fed. Rep. of Germany

Filed Apr. 15, 1982, Ser. No. 368,733

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117388

Int. Cl.³ H01R *4/36*; A44B *21/00*

U.S. Cl. 24—525 **8 Claims**



1. A mounting device for a rod-shaped proximity switch, said mounting device comprising: a fastening part, a first clamping jaw rigidly connected to the fastening part and having a first groove-like clamping face, a second clamping jaw having a second groove-like clamping face, said first and second clamping faces defining a channel matched to the cross-sectional shape of the proximity switch, an elastically deformable web connecting said second clamping jaw to the fastening part, a tightening element for moving the second clamping jaw towards the first clamping jaw and means for mounting said tightening element on said fastening part, wherein the fastening

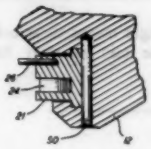
part has a mounting portion, a first and a second oblong block rigidly connected to and extending away from the mounting part with transverse spacing between the blocks, said first block forming the first clamping jaw and said second block providing the mounting means for the tightening element, said second clamping jaw being arranged between said first and second block and connected with the second block at the end facing away from the mounting part by way of the web.

4,489,468

METHOD OF PROVIDING A MULTIVALVE TURBINE NOZZLE RING INTERFACE SEAL

William A. Strasicka, Norvelt, Pa., assignor to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Jun. 24, 1982, Ser. No. 392,857
Int. Cl.³ B21K 3/00; B23P 15/04
U.S. Cl. 29—156.8 R 1 Claim



1. A method for sealing assembly clearances between a casing and a member of a turbomachine, said casing defining a groove into which the member is slidably mounted comprising the steps of:

(a) inserting a portion of the member subject to a pressurized fluid, into the groove defined by the casing;

(b) localizing the assembly clearances between the member and the casing into a single clearance by forcibly displacing the member against a wall of the groove leaving a single remaining clearance between the member and an opposite wall of the groove;

(c) making a hole in the displaced member and casing generally centered in the single clearance and of a depth and diameter greater than the height of the clearance at a location between the member and the opposite wall of the groove;

(d) driving a pin in a force fit relationship into the hole to prevent fluid communication across the pin; and

(e) repeating steps (c) and (d) in the space having pressurized fluid therein, said space being between the member and the opposite wall of the groove.

4,489,469

PROCESS FOR THE PRODUCTION OF GAS TURBINE ENGINE ROTORS AND STATORS

Robert T. Hall, Milford, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Apr. 18, 1983, Ser. No. 485,881
Int. Cl.³ B21K 3/04; B23P 15/02, 15/04
U.S. Cl. 29—156.8 R 2 Claims

1. A method of manufacturing a multibladed rotor or turbine stator or the like comprising the steps of:

(a) mounting in a radial fashion a plurality of preformed circumferentially spaced dummy blades in a dummy blade ring,

(b) filling the space around said ring and blade assembly with an elastomeric material to form a continuous annular elastomeric ring thereabout,

(c) slitting said elastomeric ring longitudinally thereof,

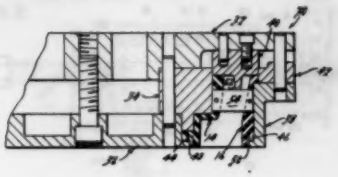
(d) stripping said elastomeric ring from said dummy blade ring and removing said dummy blades from said elastomeric ring,

(e) assembling said elastomeric ring in a vane core mold box,

(f) assembling in a radial fashion and in the position of the dummy blades a plurality of blades in said elastomeric ring,

(g) filling the space between said elastomeric ring and between said blades with a frangible core material to form a blade core ring,

(h) curing said core material,



(i) removing said blade core ring, blades, and elastomeric ring from said vane core mold box,

(j) stripping said elastomeric ring from said blade core ring,

(k) placing said blade core ring and blade assembly in a cope and drag mold system, and

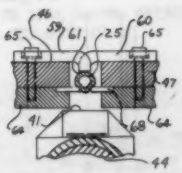
(l) casting molten metal about said blade core ring and blades to form a turbine rotor or stator.

4,489,470

REFRIGERATION APPARATUS AND METHOD OF MAKING SAME

Warren L. Hull, Avon; Wesley C. Leedahl, St. Cloud, and Donald R. Notch, Kimball, all of Minn., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jan. 26, 1982, Ser. No. 342,903
Int. Cl.³ B23P 15/26
U.S. Cl. 29—157.3 C 10 Claims



1. The method of securing a cylindrical metal tube to a metal sheet in tangential contact with said tube comprising inwardly deforming the tube wall by a pair of laterally opposed dimples to form a radially extending projection of the tube wall, placing the tube in tangential relationship with said sheet with said projection in surface-abutting contact with said sheet, clamping said tube to said sheet with welding electrodes positioned in alignment with said projection, applying a clamping force to said electrodes and applying a welding current to said electrodes to weld said projection to said sheet using a welding current and time sufficient to cause adhesion of said projection to the adjacent side of said sheet and without having the weld nugget extend to the other side of said sheet.

4,489,471

HYDRAULIC PULLING TOOL

Jack T. Gregory, Penngrove, Calif., assignor to Gregory Tool Systems, Inc., Sonoma, Calif.

Filed Dec. 1, 1983, Ser. No. 556,920
Int. Cl.³ B21J 15/06
U.S. Cl. 29—243.52 4 Claims

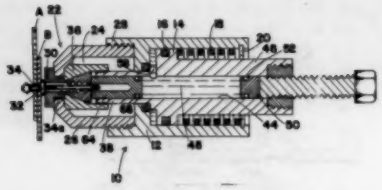
1. A hydraulic pulling tool comprising:

a cylinder;

a main piston slidable in said cylinder;

an axial bore extending into said main piston;

a plunger slidable in said bore;
at least one port opening from said bore to the leading face of said main piston;
an extension on the leading end of said main piston extending through the head of said cylinder;



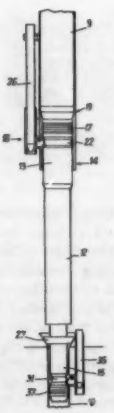
work-piece gripping means on said extension;
mechanical means for forcing said plunger into said bore; and
means biasing said main piston toward said cylinder head.

4,489,472

CONNECTION-DISCONNECTION DEVICE BETWEEN ONE RIGID PIPE, INSIDE WELL-TUBING CONNECTED TO A BASE BY AN ARTICULATED COUPLING, AND ANOTHER RIGID PIPE FIXED TO THIS BASE

Philippe Cabrit, Pau; Jean Mourlevat, Roquefort S/Garonne, and Jacques de Saint-Palais, Pau, all of France, assignors to Societe Nationale ELF Aquitaine, France

Division of Ser. No. 96,840, Nov. 23, 1979, abandoned. This application Feb. 16, 1982, Ser. No. 349,038
Claims priority, application France, Nov. 28, 1978, 78 33548
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—426.5 2 Claims



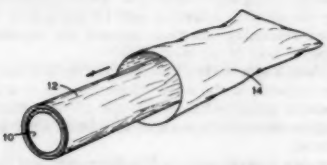
1. In a method for connecting and disconnecting one end of a first upper pipe with an opposed end of a second lower pipe, at least one of said ends having a tapered annular landing surface therein, is vertically spaced from each other and connected by a flexible pipe means having an upper and lower adapter at each end and adapted to extend therebetween, at least one of said ends of said adapters having an annular tapered landing surface thereabout matching that of the tapered surface on the pipe end to which it will be connected, said upper adapter being connected to a lowering element, said upper adapter being connected to a flexible stretchable pipe to which said lower adapter is connected, said flexible pipe and lower adapter being supported from said upper adapter and lowering element, at least one of said first and second pipes having external locking means comprising weight means and a locking component engageable by said weight means and engagable with a slot in at least one of the upper or lower adapters adjacent thereto, comprising the steps of:
lowering the entire suspended assembly of upper adapter, flexible pipe, and lower adapter by said lowering element through said first pipe for reception of said lower adapter in said second pipe and said upper adapter in said first pipe and while said locking component for said one adapter is in non-locking position;
landing at least one of said upper and lower adapters, having said tapered surface, into landing contact with the mating tapered surface of at least one of said first or second pipes;
sealing said upper and lower adapters with said respective first and second pipes;
locking said one landed adapter in its associated pipe by lowering said weight means into contact with said locking component to engage the associated slot in said one landed adapter; and
lifting said external weight means to unlock said locking component to release said assembly for withdrawal thereof.

4,489,473

METHOD FOR INSTALLING THERMAL INSULATION MATERIALS ON THE INNER SURFACE OF A DUCT

Kashiro Nakagami, Toyohashi, Japan, assignor to Isolite Babcock Refractories, Co., Ltd., Aichi, Japan

Filed Mar. 12, 1982, Ser. No. 357,514
Claims priority, application Japan, Apr. 17, 1981, 56-058280
Int. Cl.³ B23P *11/02*
U.S. Cl. 29—451 4 Claims



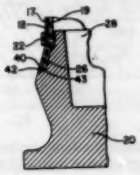
1. A method for installing thermal insulation materials on the inner surface of a duct comprising:
(a) preparing a ceramic fiber cylinder which has a shape-maintaining capability;
(b) installing a compressible and restorable thermal insulation material along the outer circumference of said cylinder to form a prepared unit;
(c) inserting said prepared unit into a bag;
(d) compressing said thermal insulation material on said cylinder by vacuum packing;
(e) applying a sleeve to the outer circumference of said vacuum packed bag and compressed material;
(f) cutting the ends of said vacuum packed bag to release the vacuum and allow said compresed insulation material to partially expand against the inside of said sleeve to form a thermal insulation cylinder unit;
(g) inserting said thermal insulation cylinder unit into a duct;
(h) cutting said sleeve;
(i) allowing said sleeve and compressed thermal insulation material to further expand against the inner circumference of said duct; and
(j) repeating the above steps until at least a substantial portion of the length of the duct is covered along its inner surface with thermal insulation material.

4,489,474

ASSEMBLING METHOD OF ROLLING LOBE AIRSPRING

Paul R. Brown, Tallmadge, and Henry D. Fresch, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 18,400, Mar. 8, 1979, abandoned. This application Apr. 20, 1981, Ser. No. 255,626
Int. Cl.³ B21D *39/00*; B23P *11/00*
U.S. Cl. 29—508 6 Claims



1. A method of assembling a rolling lobe fluid spring from at least the following components:

a mounting member;

a piston having a radially extending mounting end, and an axially and circumferentially extending piston surface, a circumferentially extending working area axially away from the piston mounting end and a circumferentially extending recess between the mounting end and the working area, the recess having a circumferentially extending blunt end axially adjacent the working area and axially away from the mounting end; and

a flexible, tubular member having a first end and a second end with a leading edge, the tubular member being of substantially uniform thickness throughout the second end to the leading edge, such that the second end is a taper free, blunt end, and the leading edge is a blunt leading edge;

the method of assembly comprising:

mounting and securing the first end of the tubular member in a fluid tight manner to the mounting member; and

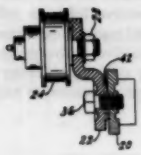
mounting and securing the second end of the tubular member to the piston in a fluid tight manner about the piston, (a) such that a circumferentially extending area of securement is defined in the second end of the tubular member, (b) such that a rolling lobe is formed in the tubular member between the area of securement and the first end of the tubular member which extends longitudinally, past the piston recess to the working area, and (c) such that a non-tapered, blunt tail including the blunt leading edge is formed in the second end of the tubular member, with the blunt tail extending from the securement area in a direction within the tubular member away from the rolling lobe and first end, the blunt tail being in the recess and thereby being between the rolling lobe and piston, and the blunt tail substantially filling the recess both axially and radially such that the blunt leading edge of the tail lies at the blunt end of the recess without a substantial gap between the blunt leading edge and blunt end of the recess, and further such that the tail has a radially outer surface which, with the working area, presents a substantially continuous surface over which the rolling lobe may roll.

4,489,475

METHOD OF CONSTRUCTING A DRIVE TENSIONING DEVICE

Hilarious S. Struttmann; Kenneth R. Donahue, and Paul W. Cooper, all of Maysville, Ky., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 28, 1982, Ser. No. 392,804
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—526 R 1 Claim



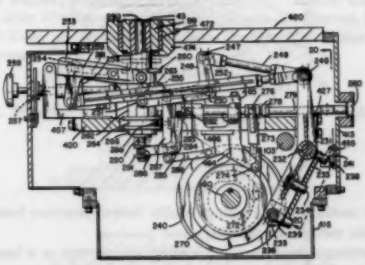
1. The method of providing a locked incremental angularly adjustable connection of two flat metal members having meeting sides which consists in; depressing separately an annular indentation in that side of each member opposite its meeting side to form annular pads having end faces projecting from the meeting sides thereof, coining radial serrations in the end faces of said annular pads, then meshing the serrations thus formed on the end faces of the pads of said members, and in detachably connecting said meshed members by a bolt passing through apertures in said members central of said annular pads.

4,489,476

MODULAR LEAD MAKER

William R. Over; Donald A. Wion, both of Harrisburg, and Richard M. Heffner, West Lawn, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 25, 1983, Ser. No. 497,931
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—564.4 7 Claims



1. Lead making apparatus of the type comprising a pair of normally aligned conductor transfer heads, each said transfer head being fixed on a vertical transfer head shaft, conductor cutting and stripping means comprising closable blades positioned between said transfer heads, conductor feed means for feeding a predetermined length of wire through said transfer heads and between said blades, a pair of conductor terminating stations remote from said cutting and stripping means, means for rotating the transfer heads from their normally aligned positions to positions adjacent respective terminating stations, said means for rotating said transfer heads acting on said transfer head shafts, means for moving each of said transfer heads vertically, a slide member on each of said transfer heads, each said slide member being movable toward and away from said blades when said heads are aligned, and toward and away from said terminating stations when said transfer heads are adjacent the terminating stations, and clamping means on each of said

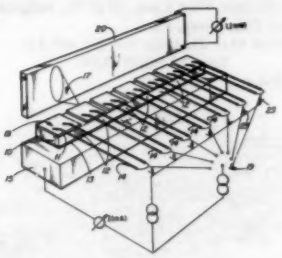
slide members for clamping fed conductor at the conclusion of feeding thereof, characterized in that each said means for moving a transfer head vertically comprises a cylindrical tracking cam fixed to the respective transfer head shaft, each said cam having an upper circumferential track and a lower circumferential track, said tracks having respective upper and lower cam followers therein, said cam followers being carried by means for moving said followers vertically, said cam followers traveling through respective tracks as the shaft is rotated, only one of said tracks on each cam being profiled to closely contain the respective follower when the heads are aligned, only the other said track on each cam being profiled to closely contain the respective follower when the heads are adjacent the terminating stations, whereby only one of said followers controls vertical movement at each said position of the heads.

4,489,477

METHOD FOR SCREENING LASER DIODES

Kiu-Chi D. Chik; Tibor F. Devenyi, both of Nepean, and John C. Dyment, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 23, 1984, Ser. No. 582,956
Int. Cl.[3] G01R *31/36*
U.S. Cl. 29—569 L 5 Claims



1. A method of screening double heterostructure laser diodes, the method comprising:

subjecting a laser diode to a range of currents at a laser pn normal junction operating temperature and monitoring lasing threshold current and lasing slope efficiency for the laser diodes;

subjecting the laser diode to a burn-in process at a substantially higher junction temperature and a relatively high operating current for an extended time;

subjecting the laser diode at the laser pn normal junction operating temperature to said range of currents and measuring laser light output to monitor the lasing threshold current and lasing slope efficiency of the laser diode after the burn-in process;

determining any change in laser threshold current and slope efficiency as between the first and second monitoring steps; and

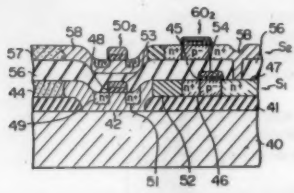
continuing a laser diode manufacturing process only for those laser diodes having a threshold increase and slope efficiency decrease less than a predetermined critical value.

4,489,478

PROCESS FOR PRODUCING A THREE-DIMENSIONAL SEMICONDUCTOR DEVICE

Junji Sakurai, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 28, 1982, Ser. No. 425,644
Claims priority, application Japan, Sep. 29, 1981, 56-154613; Sep. 29, 1981, 56-154614; Oct. 19, 1981, 56-167370
Int. Cl.[3] H01L *21/66*
U.S. Cl. 29—574 9 Claims



1. A process for producing a semiconductor device comprising a substrate, first and second semiconductor layers formed on the substrate, and an insulating film formed between the first and second semiconductor layers for insulating the first and second semiconductor layers from one another, the process comprising the steps of:

(a) preparing the substrate;

(b) forming the first semiconductor layer on the substrate;

(c) forming a first group of circuit elements, including a plurality of first semiconductor elements, in the first semiconductor layer;

(d) forming a first monitoring device, for monitoring the properties of the first group of circuit elements, on the first semiconductor layer;

(e) measuring the properties of the first monitoring device, thereby evaluating a circuit function of the first semiconductor elements;

(f) forming the insulating film on the first semiconductor layer;

(g) forming the second semiconductor layer on the insulating film;

(h) forming a second group of circuit elements, including a plurality of second semiconductor elements, in the second semiconductor layer;

(i) forming a second monitoring device on the second semiconductor layer;

(j) forming a conductor, extending through the insulating film, for electrically connecting the first monitoring device in the first semiconductor layer with the upper surface of the second semiconductor layer; and

(k) measuring the properties of the first monitoring device via the conductor.

9. A process for producing a semiconductor device having a substrate, comprising the steps of:

(a) forming a first semiconductor layer on the substrate;

(b) forming a first group of circuit elements, including first semiconductor elements, in the first semiconductor layer;

(c) forming a first monitoring device, for monitoring the first group of circuit elements, on the first semiconductor layer;

(d) forming a first insulating layer on the first semiconductor layer;

(e) forming a second conductor layer on the first insulating layer;

(f) forming a second group of circuit elements, including second semiconductor elements, in the semiconductor layer;

(g) forming a second monitoring device, for monitoring the second group of circuit elements, on the second semiconductor layer;

(h) forming a conductor, extending through the insulating

layer, for electrically connecting the first monitoring device to the upper surface of the second semiconductor layer; and

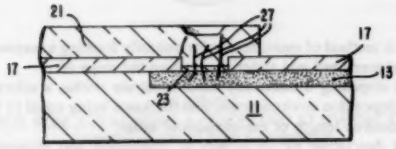
(i) measuring the properties of the first monitoring device via the conductor.

4,489,479

METHOD FOR REPAIR OF BURIED CONTACTS IN MOSFET DEVICES

Steven E. Shields, San Diego, and David A. Robinson, Oceanside, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 1, 1983, Ser. No. 528,495
Int. Cl.³ H01L 21/88
U.S. Cl. 29—575 6 Claims



1. A method of overcoming the effect of an undesirably intervening oxide layer in a silicon wafer of integrated circuits between a defined conductive area of a layer of polycrystalline silicon which extends over a surface of said wafer and a doped region in said wafer underlying said defined area, said oxide layer interfering with the creation of a contact between said polycrystalline silicon and said doped region in said defined area, comprising the steps of:

(a) depositing a dot of aluminum on said polycrystalline silicon layer on said defined area; and

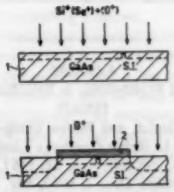
(b) annealing said wafer at an elevated temperature so as to drive said aluminum into said doped region through said polycrystalline silicon layer and through said undesirably intervening oxide layer.

4,489,480

METHOD OF MANUFACTURING FIELD EFFECT TRANSISTORS OF GAAS BY ION IMPLANTATION

Gérard M. Martin, Paris; Shérif Makram-Ebeid, Limeil-Brevannes, and Camille Venger, Montfermeil, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 30, 1983, Ser. No. 480,445
Claims priority, application France, Apr. 9, 1982, 82 06290
Int. Cl.³ H01L 21/263, 27/12
U.S. Cl. 29—576 B 12 Claims



1. A method of manufacturing a field effect transistor comprising the steps of

providing a semi-insulating substrate of gallium arsenide,

forming a layer of n-type gallium arsenide on said substrate by implanting donor ions into said substrate, and

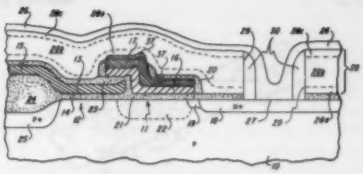
implanting oxygen ions at least in a region of said substrate where a channel region of said field effect transistor is formed.

4,489,481

INSULATOR AND METALLIZATION METHOD FOR VLSI DEVICES WITH ANISOTROPICALLY-ETCHED CONTACT HOLES

Gary W. Jones, Sugarland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 20, 1982, Ser. No. 420,153
Int. Cl.³ H01L 21/283
U.S. Cl. 29—591 15 Claims



14. A method of making a contact at a face of a semiconductor body, comprising the steps of:

covering said face with a first coating of insulator;

opening a hole in said first coating by an anisotropic etch which leaves steep sidewalls;

applying a second coating of insulator to said face by an isotropic deposition which coats said sidewalls;

subjecting said face to an anisotropic etch to leave the second coating at said sidewalls but remove the second coating at a contact area in said hole,

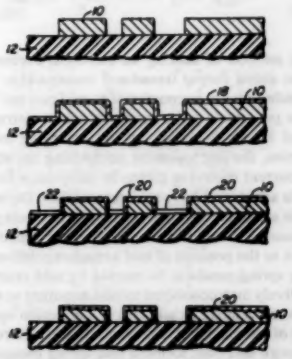
applying a conductive strip by coating said face with a conductive material then patterning the conductive material to leave said strip extending down said sidewalls to engage said contract area in said hole.

4,489,482

IMPREGNATION OF ALUMINUM INTERCONNECTS WITH COPPER

Thomas Keyser, Mountain View; Michael E. Thomas, Cupertino; John M. Pierce, Palo Alto, and James M. Cleeves, Redwood City, all of Calif., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Jun. 6, 1983, Ser. No. 501,348
Int. Cl.³ H01L 21/92, 21/285
U.S. Cl. 29—591 6 Claims



1. A method for forming aluminum-copper interconnects on a semiconductor device, said method comprising:

(a) layering aluminum substantially free from copper onto the device;

(b) etching a predetermined interconnect pattern in the

resulting aluminum layer prior to layering copper on the device;

(c) removing aluminum oxide from the surface of the aluminum;

(d) layering copper onto the resulting aluminum interconnect lines, wherein at least steps (c) and (d) are performed substantially in a vacuum; and

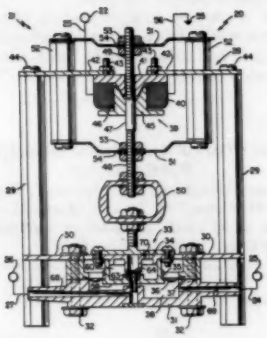
(e) diffusing the layered copper into the aluminum by exposing the device to an elevated temperature.

4,489,483

METHOD OF MAKING AN ELECTRICAL CURRENT INPUT TO A PNEUMATIC SIGNAL OUTPUT TRANSDUCER CONSTRUCTION

James A. Crowson, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 265,599, May 20, 1981, Pat. No. 4,401,263.
This application Jun. 13, 1983, Ser. No. 503,815
Int. Cl.[3] H01F *41/00*; H01H *11/00*
U.S. Cl. 29—602 R 3 Claims



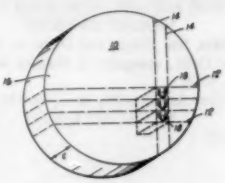
1. In a method of making an electrical current input to a pneumatic signal output transducer construction wherein said signal is substantially proportional to said current and is generated by a pneumatic relay means of said construction that is controlled by an electrical current receiving means of said construction, the improvement comprising the steps of forming said current receiving means to comprise a fixed electrical coil that is adapted to have said current flow therethrough and a movable armature disposed in said coil and being operatively interconnected to said relay means to control said relay means in relation to the position of said armature relative to said coil, disposing spring means to be carried by said construction and be operatively interconnected to said armature to tend to move said armature relative to said coil in a direction opposite to the direction of movement of said armature upon increased current flow through said coil, forming said spring means to comprise a plurality of leaf springs, disposing said leaf springs on opposite sides of said coil, forming said armature with a shaft interconnected thereto and extending from opposed sides of said armature, interconnecting opposed ends of said shaft respectively to said leaf springs, and adjustably interconnecting said opposed ends of said shaft to said leaf springs.

4,489,484

METHOD OF MAKING THIN FILM MAGNETIC RECORDING HEADS

Fred S. Lee, 6705 Eastwood Cir., Oklahoma City, Okla. 73132

Filed Sep. 2, 1977, Ser. No. 830,104
Int. Cl.[3] G11B *5/42*
U.S. Cl. 29—603 8 Claims



1. A method of manufacture for unitarily forming a magnetic transducer head and slider comprising the steps of:

(a) disposing a uniformly thick substrate within a selected deposition environments, said thickness being equal to the desired length of the transducer slider;

(b) depositing by serial acts of deposition and etching a magnetic read/write formation with associated conductors at a predesignated coordinate area on the surface of said substrate, said step of depositing including the steps of:

(i) forming a shield adjacent said substrate, said shield being formed of alternating magnetic thin film pairs;

(ii) forming a magnetoresistive stripe by depositing a magnetic thin film sensor in insulated disposition over said shield;

(iii) depositing read conductors in contact with said thin film sensor;

(iv) forming a thin film permanent magnet bias layer over said thin film sensor in insulated disposition therefrom;

(v) depositing a thin film shield pole in insulated disposition over said bias layer;

(vi) depositing a write conductor in insulated disposition over said shield pole; and

(vii) depositing a trailing edge thin film pole in insulated disposition over said write conductor,

each of said shield pole and trailing edge pole being formed by serial deposition of alternating thin film pairs of magnetic and insulative material;

(c) cutting said coordinate area from said substrate; and

(d) finishing and polishing said cut substrate to form a transducer slider of requisite size and shape with said magnetic read/write formation disposed to place the sensing area in operative position for sense interaction with a recording medium.

4,489,485

METHOD FOR FORMING A THERMAL PRINTING HEAD

Yutaka Tatsumi, Osaka, and Hideo Taniguchi, Kyoto, both of Japan, assignors to Rohm Company Limited, Kyoto, Japan

Division of Ser. No. 298,068, Aug. 31, 1981, Pat. No. 4,463,246.
This application Dec. 2, 1983, Ser. No. 557,369
Claims priority, application Japan, Sep. 8, 1980, 55-124997
Int. Cl.[3] H01C *17/06*; H05B *1/00*
U.S. Cl. 29—620 7 Claims

1. A method for forming a thermal printing head, comprising:

laying a base of an electrically insulating material;

forming a glaze layer having a raised surface on said base, said raised surface of said glaze layer having an elongated main portion and an extension from an end of said main portion, said extension having less glaze per unit area than

said main portion to relieve the glaze layer of surface tension; and,

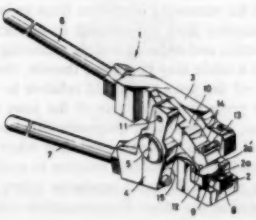
forming a thermal printing element on said main portion of said glaze layer.

4,489,486

TOOL FOR ATTACHING A COUPLING ELEMENT TO A CONCEALED SLIDE FASTENER

Kibei Takahashi, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 4, 1983, Ser. No. 491,459
Claims priority, application Japan, May 4, 1982, 57-65380[U]
Int. Cl.³ A41H 37/06; B21D 53/52; B22D 19/10
U.S. Cl. 29—769 4 Claims



1. A hand tool for attaching a metallic coupling element to a stringer tape of a concealed slide fastener, comprising:

(a) a pair of first and second members pivotally connected to one another, each member having at one end a handle;

(b) a lower jaw secured to the other end of said first member on an inner side thereof and having at least two first recesses laterally spaced apart from one another by a predetermined distance, each of said first recesses being receptive of a prospective coupling element;

(c) an upper jaw pivotally connected at one end to the other end of said second member and having at the other end a second recess engageable with a leg portion of the coupling element placed in one of said first recesses, said upper jaw being movable, in response to pivotal movement of said first and second members relatively to one another by manipulating such two handles, between a retracted position in which said second recess is disposed remotely from said first recess for allowing both the prospective coupling element and the stringer tape to be placed on said first jaw, and an advanced position in which said second recess is disposed close to said first recesses for deforming the leg portion of the coupling element so as to clench the latter about a longitudinal edge of the stringer tape; and

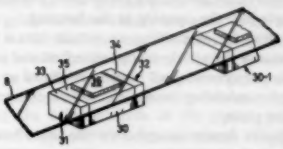
(d) means for regulating movement of said upper jaw with respect to said lower jaw while said upper jaw is moved between said retracted and advanced positions.

4,489,487

ELECTRONIC COMPONENT AND ADHESIVE STRIP COMBINATION, AND METHOD OF ATTACHMENT OF COMPONENT TO A SUBSTRATE

Ernst Bura, Bickenbach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,410
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1981, 3104623
Int. Cl.³ H05K 3/34; B65D 73/02
U.S. Cl. 29—840 12 Claims



1. Electronic component (10, 20, 30, 40) and adhesive strip combination, in which the component is adapted for attachment to a substrate (5) such as a printed circuit board, said component having

a flat engagement surface (15, 25, 35) and end connecting strips (13, 14; 23, 24; 33, 34) of conductive material extending along marginal portions of said engagement surface,

a double-sided adhesive strip (26, 36) having continuous bonding characteristics adhered with one adhesive side thereof on said engagement surface between the end strips with clearance between said end connecting strips and said tape or strip;

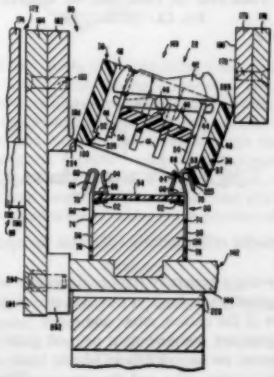
and a strippable foil (8) covering said strip at the side remote from said flat engagement surface to protect the adhesive side of said adhesive strip remote from the side adhered to the component but permit stripping the component off the foil (8) prior to engagement with the substrate.

4,489,488

METHODS OF AND APPARATUS FOR ASSEMBLING AN ARTICLE INTO A HOUSING

Robert MacTribble, Winston-Salem, N.C., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Apr. 13, 1982, Ser. No. 367,842
Int. Cl.³ H01R 43/04; B23P 19/00
U.S. Cl. 29—881 27 Claims



1. A method of assembling an article into a housing in which portions of the article on first and second opposite sides of the

article project outward beyond edges of an opening in the housing for receiving the article, which comprises the steps of:

supporting the article in an assembling position;

supporting the housing above the article with the opening in the housing essentially aligned with the article;

releasing a first side of the housing so that the first side of the housing tips downward by gravity to receive the projecting portions on the first side of the article into the opening in the housing; and

then releasing a second opposite side of the housing so that the second side of the housing drops downward by gravity to receive the projecting portions on the second side of the article into the opening in the housing.

13. Apparatus for assembling an article into a housing in which portions of the article on opposite first and second sides of the article project outward beyond edges of an opening in the housing for receiving the article, which comprises:

a main base plate;

article support means mounted on the main base plate for supporting the article in an assembling position;

housing support means mounted on the main base plate for supporting the housing above the article in the assembling position with the opening in the housing essentially aligned with the article, the housing support means including first and second releasable means for supporting first and second opposite sides of the housing, respectively; and

means attached to the housing support means for causing the first and second releasable means to release their respective first and second opposite sides of the housing in sequence such that the first side of the housing initially tips downward by gravity to receive the projecting portions on the first side of the article into the opening in the housing, and such that the second side of the housing then drops downward by gravity to receive the projecting portions on the second side of the article in the opening in the housing.

4,489,489

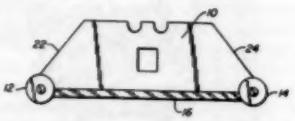
DISPOSABLE UTILITY BLADE

Julius A. Sarto, 773 Pershing St., San Jose, Calif. 95014

Filed Feb. 10, 1983, Ser. No. 465,512

Int. Cl.³ B67B 7/30

U.S. Cl. 30—2 **5 Claims**



1. A disposable utility cutting apparatus for opening cartons comprising:

a blade having a generally trapezoidal shape with a cutting edge formed on its longest side and two cutting points at the ends of the cutting edge; and

protecting means comprising a pair of generally circular disks spaced on opposite faces of said blade and overlapping the cutting point and the corresponding portion of the cutting edge of said blade, said disks being connected to one another through said blade for protecting the contents of the carton during cutting.

4,489,490

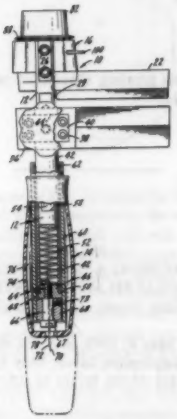
CABLE STRIPPER

Leonard H. Michaels, Warrenville, and Jerry E. Stuart, Sycamore, both of Ill., assignors to Ideal Industries, Inc., Sycamore, Ill.

Filed May 20, 1982, Ser. No. 380,220

Int. Cl.³ H02G 1/12

U.S. Cl. 30—90.1 **18 Claims**



1. In a tool for removing insulation from an insulated cable, including clamping jaws constructed to perform an opening and closing action and defining a cable receiving zone therebetween so that a cable may be placed therein, the zone permitting rotation of the jaws and cable relative to each other, a cutting blade projecting from one of the jaws into the cable receiving zone, and means for automatically causing the blade to cut a helical path in the cable insulation when the cable and jaws are rotated in one direction relative to each other and to cut a circular path in the cable insulation when the cable and jaws are rotated in the other direction relative to each other.

4,489,491

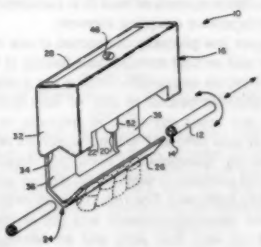
CUTTING TOOL FOR JACKETED CABLE

Donald L. Gregson, Paradise, Calif., assignor to Harris Corporation, Chatsworth, Calif.

Filed Aug. 30, 1982, Ser. No. 412,889

Int. Cl.³ B21F 13/00

U.S. Cl. 30—90.7 **2 Claims**



1. A device for cutting the outer jacket of coaxial or like cable, comprising: a main support body having a longitudinally extending underside; means supported by said main body and including a dome depending from said underside and having a lowermost generally spherical surface, a knife edge extending downwardly from said lowermost spherical surface and means

for adjusting the position of said knife edge relative to said generally spherical surface; and a longitudinally extending, upwardly opening V-shaped gripping tray at least as long as the normal width of four adult fingers adapted to receive a longitudinal section of said cable, said tray being supported by said main body under said knife edge for movement between a first biased lowermost position sufficiently far from said knife to place said cable section out of engagement with the latter and a second raised position sufficiently close to said cutting edge for placing the outer jacket of said cable section in cutting engagement with said knife edge, whereby an individual user can place the tray in its raised position using all four fingers of one hand while pulling the cable longitudinally through the tray in order to cause the knife to cut its outer jacket in the longitudinal direction.

4,489,492

NIBBLING TOOL FOR SHEARING SHEET MATERIAL

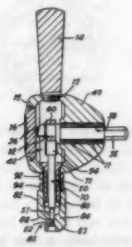
James R. Diggins, 37 W. Common, Lindfield, Sussex RH 16 1AJ, England

Filed Jun. 1, 1982, Ser. No. 383,864

Claims priority, application United Kingdom, Jun. 5, 1981, 8117203

Int. Cl.³ B26B *13/00*

U.S. Cl. 30—241 **5 Claims**



1. A nibbling tool for shearing sheet material and for attachment to an external drive mechanism, comprising:

a shaft to be driven by an external drive mechanism,

a housing in which said shaft is rotatably mounted to extend externally of the housing for connection to a said external drive mechanism,

a piston member, a punch mounted on the piston member, and a pin extension of the punch member, said punch and pin-extension being coaxial with the piston member,

coupling means within said housing for coupling said shaft with said piston member to translate rotation of said shaft into reciprocation of said piston member,

a piston guide piece with a passage therein for the piston member, a housing aperture in said housing through which housing aperture said piston guide piece projects externally of said housing,

a head portion on said piston guide piece for co-operating with said housing internally thereof to prevent thereby rotation of the piston guide piece,

a die carrying member including a die for cooperation with said punch to shear sheet material

said die carrying member having a first portion and a second portion spaced from said first portion by an intermediate spacer portion thereof,

and mounting means mounting said first portion on the piston guide piece,

said intermediate spacer portion defining the cutting region of the tool in which sheet material sheared is entered between said first and second portions of the die carrying member,

said first and second portions having passages therein for the travel therein of the piston member and the punch respectively, wherein there is provided a first locking member arranged externally of the housing and adapted to releasably lock said piston guide member axially relative to said housing,

abutment means internally of the housing and juxtaposed with said housing aperture, said abutment means co-operating with said head section of the piston guide member to prevent rotation thereof when said first locking member secures the axial position of said piston guide member, the arrangement affording provision to reset the cutting direction of the tool, said resetting being accomplished by releasing the locking member to permit axial movement of the piston guide member, displacing the piston guide member axially inwardly of the housing to an extent such that the head section may be rotated to thereby rotate the die carrying member to another cutting position, axially returning the piston guide member to its initial axial position relative to the housing, and again locking the axial position of the piston guide member relative to the housing by means of said first locking member,

and wherein a first seating surface of spherical curvature is located internally of the housing and around said housing aperture, and a second seating surface of spherical curvature is formed on the piston guide member, whereby the first and second seating surfaces are in direct load bearing contact in the assembled tool.

4,489,493

CHAIN SAW GUIDE BAR

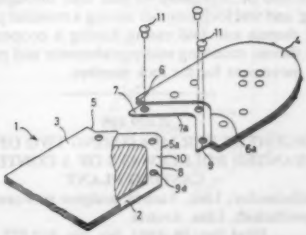
Toshihiro Tsumura, Miki, Japan, assignor to Suehiro Seiko Kabushiki Kaisha, Miki, Japan

Filed Mar. 30, 1983, Ser. No. 480,339

Claims priority, application Japan, Jul. 21, 1982, 57-111585[U]

Int. Cl.³ B27B *17/02*

U.S. Cl. 30—387 **8 Claims**



7. A chain saw guide bar comprising a main part having a foward end, a front part having a rearward end, a joint between said forward and rearward ends and formed by a tongue portion on one of said parts and a groove portion on the other of said parts, and fasteners extending through said joint and securing said parts together, each of said tongue and said groove portions forming three V-shaped edges, and each of said edges of said tongue portion of said joint abutting a complementary shaped edge of said groove portion of said joint.

4,489,494

TAPE LOCKING DEVICE

Werner Duda, W. Sayville, N.Y., assignor to Irwin Measuring Tool Company, Patchogue, N.Y.

Filed Jan. 29, 1982, Ser. No. 344,199

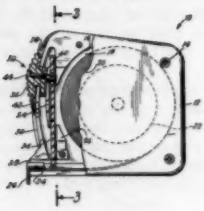
Int. Cl.³ G01B *3/10*

U.S. Cl. 33—138 **9 Claims**

1. In a retractable tape measure including a casing having front and sidewalls and a coiled tape rule therein including a free end extending through an opening in said front wall and

means for retracting the tape, the improvement comprising means for locking the tape against automatic retraction in an extended position including a lock member having a free end and an opposed mounting end mounted in one of the sidewalls of said casing to permit arcuate pivotal movement of the locking member in a plane generally transverse to the direction of retraction of the tape and to said sidewalls, said free end being located to engage said tape and hold it against a portion of the casing in a first pivoted position of the lock member and to be spaced from the tape in a second pivoted position of the lock member, and means for pivoting said lock member between said first and said second pivoted positions.

6. A tape rule comprising a casing having a tape dispensing opening therein, a tape rule coiled in said casing and having a free end extending through said opening; means for retracting



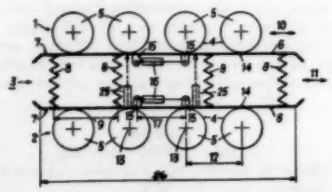
the tape through said opening and winding the tape into a coil; and means for selectively locking said tape in an extended position including a lock member pivotally mounted in said casing for movement between first and second positions, said lock member having a free end located to engage said tape rule against a portion of the casing in said first position to lock the tape rule against retraction; and a second position spaced from the rule to permit unimpeded retraction thereof; and means for pivoting said lock member between said first and second positions; said lock member being mounted to pivot transversely of the direction of movement of said tape through said casing opening; and said lock member having a rounded protuberance formed therein and said casing having a cooperating recess formed therein receiving said protuberance and providing the pivotal movement for the lock member.

4,489,495

ARRANGEMENT FOR MEASURING TWO OPPOSITELY ARRANGED ROLLERWAYS OF A CONTINUOUS CASTING PLANT

Alois Scheinecker, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 24, 1982, Ser. No. 422,877
Claims priority, application Austria, Oct. 9, 1981, 4345/81
Int. Cl.³ G01B 7/04, 7/14
U.S. Cl. 33—143 L **5 Claims**



1. In an arrangement for measuring two oppositely arranged rollerways of a continuous casting plant equipped with rollers having surface areas, of the type including

a measuring body movable through a section formed between said rollerways, said measuring body having contact surfaces formed by a pair of oppositely arranged elastically deformable spring strips contacting said surface areas of said rollers, and

pressure means arranged between said contact surfaces for pressing said contact surfaces to said surface areas of said rollers, the improvement comprising

a distance alteration measuring means, and

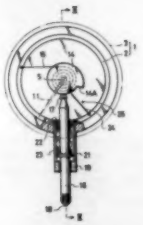
mounting means for attaching said distance alteration measuring means in its entirety to an inner side of one of said spring strips, said mounting means comprising holding means mounted on the inner sides of said spring strips, each of said distance-alteration measuring means being inserted between two of said holding means and extending substantially in the moving direction of the arrangement.

4,489,496

DIAL GAUGE

Ichiro Mizuno, and Iwao Sugizaki, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1983, Ser. No. 463,108
Claims priority, application Japan, Feb. 8, 1982, 57-18589
Int. Cl.³ G01B 3/22
U.S. Cl. 33—172 R **13 Claims**



1. A dial gauge comprising: a case body; a spindle provided at the forward end thereof with a measuring element and axially displaceable secured to said case body; a rotatable cam having a circumferentially varying radius surface engaged by a portion of said spindle, the displacement direction of said spindle portion being approximately toward and away from the rotation axis of said cam; low friction means interposed between said cam and spindle portion for rotation of the cam by an axial displacement of said spindle in said case body not past the rotation axis of said cam; and an indicating mechanism for indicating an axial displacement value of said spindle by a rotation of said cam.

4,489,497

GROOVE MEASURING GAUGE

John H. Schemel, and A. Bruce Cady, both of Kennewick, Wash., assignors to Sandvik Special Metals Corp., Kennewick, Wash.

Filed Mar. 14, 1983, Ser. No. 475,192
Int. Cl.³ G01B 7/00
U.S. Cl. 33—172 E **18 Claims**

1. A groove measuring gauge for measuring the contours of a groove in a workpiece, comprising:

a frame;

a rotatable centering headpiece rigidly attached to the frame for supporting the workpiece;

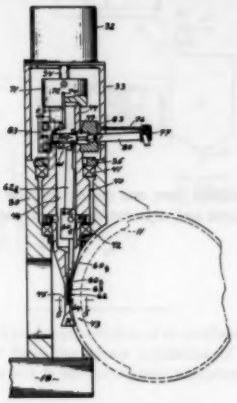
a rotatable centering tailpiece rigidly attached to the frame for supporting the workpiece;

a gauge head connected to the frame and extending adjacent to a workpiece supported between said centering headpiece and tailpiece;

a spindle rotatably supported within the gauge head for rotation about a spindle axis; the spindle being supported by at least two spaced apart spindle bearings, the spindle

bearings being angular contact bearings arranged in an opposed fashion to eliminate clearance between the spindle and the gauge head and very precisely position the spindle;

a measuring arm pivotably mounted within the spindle at a measuring arm pivot which is transverse to the spindle axis; the measuring arm pivot being positioned between at least two of the spindle bearings to provide optimum



rigidity; the measuring arm having an enclosed end and an exposed end, the exposed end having an outer face which extends from the spindle as the measuring arm is pivoted, to engage the surfaces of the groove; and

micrometer means connected to the spindle and connected to the enclosed end of the measuring arm for detecting and measuring the position of the measuring arm; and

biasing means for biasing the measuring arm outer face into an extended position.

4,489,498

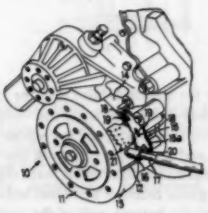
BRACKET QUALIFIER DEVICE

Steven L. Christophersen, Clarkston, Mich., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Filed May 2, 1983, Ser. No. 490,723

Int. Cl.³ G01M *15/00*

U.S. Cl. 33—180 AT **4 Claims**



1. A bracket qualifier device for use with an engine including a rotating part having marking means thereon representing top dead center, a fixed part adjacent to the rotating part, a bracket attached to the fixed part, the bracket having an attachment flange and an indicia flange and a receptacle flange, the attachment flange being attached to the fixed part, the indicia flange bearing indicia indicative of offset and having a first mating portion, the receptacle flange having a tendency to move and become displaced with respect to the attachment flange and the indicia flange, the receptacle flange carrying a receptacle which is periodically passed by the marking means and which is adapted to receive a magnetic pick-up probe, the bracket qualifier device comprising a body and first and second legs carried by said body, said first leg having a shape substantially matching the shape of the receptacle, a second mating portion on said second leg and having a shape substantially matching the shape of said first mating portion so as to be matable therewith, said first leg being adapted to fit into the receptacle and the receptacle being bendable to enable said second mating portion to mate with the first mating portion.

4,489,499

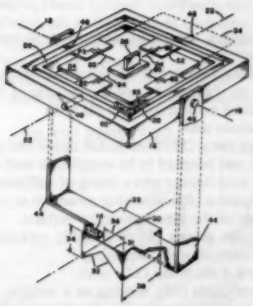
MULTI-AXES CENTERING FIXTURE

Anthony P. Frissora, Mendham Township, Morris County, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 25, 1983, Ser. No. 497,969

Int. Cl.³ G01B *5/14, 5/25*

U.S. Cl. 33—181 R **12 Claims**



1. An alignment apparatus for aligning a selected object with respect to a top-dead-center portion of a cylindrical roll, comprising:

(a) a support base adapted to mount on a peripheral, circumferential surface of said cylindrical roll and over the top-dead-center portion thereof;

(b) level indicator means mounted on said base for indicating the orientation of said base;

(c) an outer frame which is pivotably mounted on said base to pivot about an outer gimbal access;

(d) an inner frame which is pivotably mounted in said outer frame and adapted to rotate about an inner gimbal axis, said inner gimbal axis being oriented substantially perpendicular to said outer gimbal axis;

(e) a positioning plate moveably mounted in said inner frame and adapted to move along a reference plane defined by said inner frame;

(f) follower means connected to said positioning plate for aligning said positioning plate with a selected portion of said object; and

(g) reference means for indicating the relative alignment of said positioning plate with respect to the top-dead-center of said cylindrical roll.

4,489,500

ASSEMBLY, TESTING AND REPAIR UNIVERSAL STAND FOR MOTOR VEHICLES

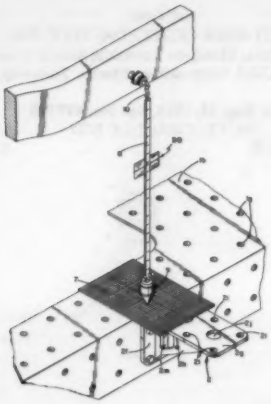
Claude R. Valat, 139 Boulevard Murat, 75016 Paris, France

Division of Ser. No. 227,093, Nov. 26, 1980, Pat. No. 4,447,961. This application Jul. 21, 1983, Ser. No. 515,814

Claims priority, application PCT Int'l Appl., Mar. 26, 1980, WO80/00045

Int. Cl.³ G01B 5/25; G01C 15/10

U.S. Cl. 33—394 **7 Claims**



1. A measuring device for three-dimensional checking of a vehicle comprising:

(a) attaching means (20–25) for suspending said measuring device to chosen parts of the vehicle to be checked,

(b) a vertical measuring tape (8) with graduations and

a linking piece (10) fixed to the upper end of the measuring tape, and adapted to be coupled to said attaching means (20), said linking piece being of sufficiently low friction in regard to the attaching means so as to ensure that the whole of the tape is exactly vertical,

(c) a bottom means (9) of roughly cylindroconical shape with a vertical axis, including

a hollow main body (11), with

a bottom point (12), serving as a weight,

a compensating spring (14) for the measuring tape is contained in a spiral wind, in said hollow body when it is not in use,

an exit slot (16) out of which the tape (8) emerges in the axis of said bottom means (9), and

a pointer (17) allowing the length of tape (8) out of said hollow body to be read off.

4,489,501

SPIN DRIER FOR SILICON WAFERS AND THE LIKE

Seiichiro Aigo, 3-15-13, Negishi, Daito-ku, Tokyo, Japan

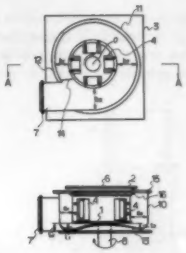
Filed Sep. 24, 1982, Ser. No. 423,153

Claims priority, application Japan, Jul. 1, 1982, 57-100519[U]

Int. Cl.³ F26B 11/18

U.S. Cl. 34—8 **6 Claims**

1. In a spin drier for silicon wafers and the like including a rotor equipped with at least one holder for a carrier, which is adapted to enclose a silicon wafer or the like therein, and a casing embracing the rotor, the improvement comprising a radial distance between a circumferential wall of the casing and a central axis of the rotor gradually increasing as the circumferential wall extends around the rotor in its circumferential direction from a position adjacent an air exhaust port provided at a selected location in the circumferential wall to an air exhaust port; a bottom wall of the casing gradually sloping downwardly in a direction parallel to the central axis from the position adjacent the air exhaust port circumferentially around



to the air exhaust port; and means defining an air intake port above the rotor and adjacent the central axis.

4,489,502

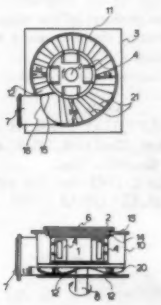
SPIN DRIER FOR SILICON WAFERS AND THE LIKE

Seiichiro Aigo, 2-15-13, Negishi, Daito-ku, Tokyo, Japan

Filed Nov. 3, 1982, Ser. No. 438,973

Int. Cl.³ F26B 11/18

U.S. Cl. 34—8 **4 Claims**



1. In a spin drier for silicon wafers and the like including a rotor having a lower face and equipped with at least one holder for a carrier, which is adapted to enclose a silicon wafer or the like therein, and a casing embracing the rotor and having a bottom wall and a circumferential wall, the improvement which comprises a guide member provided between the lower face of the rotor and the bottom wall of the casing and formed of a plurality of guide blades extending downwardly slanted in the rotating direction of the rotor, the radial distance between the circumferential wall of the casing and a central axis of the rotor gradually increases as the circumferential wall extends around the central axis of the rotor in the circumferential direction from a position adjacent an air exhaust port provided at a selected location in the circumferential wall of the casing to the air exhaust port, the bottom wall of the casing gradually sloping down all around the central axis of the rotor in the circumferential direction from a position adjacent the air exhaust port, to the air exhaust port.

4,489,503

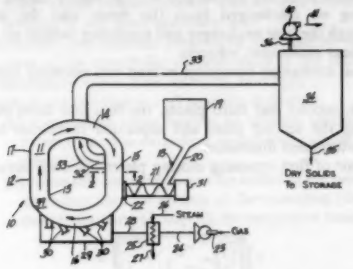
PROCESS FOR DRYING WET PARTICLES OF AVAILABLE HALOGEN COMPOUNDS

James H. Browne; Robert H. Ward, both of Lake Charles, La., and Frank E. Albus, Willow Grove, Pa., assignors to Olin Corporation, Cheshire, Conn.

Filed Nov. 28, 1980, Ser. No. 210,698

Int. Cl.³ F26B *3/10*

U.S. Cl. 34—10 **15 Claims**



1. A process for drying wet particles of an available halogen compound selected from the group consisting of N-chloro organic compounds and N-bromo organic compounds which comprises:

a. forming a substantially vertical circulating bed of dried particles of said available halogen compound suspended in a heated gas in a circular annular zone, said zone having an exterior perimeter and an interior perimeter and having contiguous sections comprised of a top, a feed side, a bottom and a drying side,

b. feeding wet particles of said available halogen compound into said circulating bed from the exterior perimeter of said feed side,

c. feeding additional heated gas tangentially into said zone from the exterior perimeter of said bottom, at a temperature in the range from about 100° to about 220° C., the velocity of said heated gas being sufficient to maintain said circulating bed in said zone,

d. withdrawing a product portion from said circulating bed from the interior perimeter of said feed side, downstream from said top, and

e. recovering said dried particles of available halogen compound from said product portion.

4,489,504

STEAM GRANULATION APPARATUS AND METHOD

Karl Hammer, Lörrach, Fed. Rep. of Germany, assignor to Aeromatic AG, Switzerland

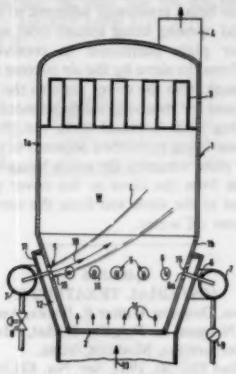
Filed Feb. 3, 1982, Ser. No. 345,203

Claims priority, application Switzerland, Feb. 10, 1981, 880/81

Int. Cl.³ F26B *3/08*

U.S. Cl. 34—10 **41 Claims**

1. A method of granulating a bed of fluidized particles, comprising the steps of injecting a jet of steam into the bed of fluidized particles and injecting a jet of a gas other than steam into the bed of fluidized particles such that said jet of gas substantially envelops said jet of steam until said jet of steam penetrates the bed of fluidized particles a predetermined distance, whereby said jet of gas forms a temporary jacket of gas between the fluidized particles and said jet of steam to thereby inhibit said jet of steam from condensing onto the particles until said jet of steam penetrates the bed of fluidized particles said predetermined distance, at which point said jet of steam



condenses onto the particles to facilitate their granulation without excessive local wetting and overheating.

4,489,505

DEVICE FOR THE DEHYDRATION AND DRYING OF SOLIDS, ESPECIALLY OF HYDRAULICALLY(UNDERWATER-)GRANULATED PLASTIC MATERIALS

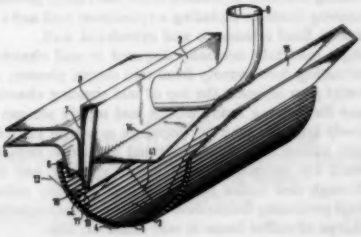
Hans Hench, Inzlingen; Horst Lettner, Glattbach, and Friedrich Hunke, Grossostheim, all of Fed. Rep. of Germany, assignors to Automatik Apparate-Maschinenbau H. Hench GmbH, Grossostheim, Fed. Rep. of Germany

Filed Feb. 9, 1982, Ser. No. 347,371

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1981, 3105609

Int. Cl.³ F26B *17/10*

U.S. Cl. 34—57 R **12 Claims**



1. A device for the dehydration and drying of solids from a mixture of solids and water, said device comprising:

a curved sieve;

supply means for supplying the mixture of solids and water to the sieve;

air jet inlet means spaced from the sieve and positioned adjacent to the supply means for producing an accelerated air current in the direction of the sieve, said air current defining an angle of incidence with the sieve, said angle being defined between the central point of impact of the air current on the sieve and the tangent to the sieve at the central point of impact, wherein the mixture is propelled against the sieve by the air current at the angle of incidence to force water through the sieve and to bounce the solids against the sieve, said angle of incidence being between 25° and 75°;

a mouthpiece opening defined by said air jet inlet means, said air current passing through said opening to the sieve;

a flat cover plate spaced from the sieve, one end of said cover plate being positioned adjacent to said air jet inlet means, said opening being spaced from said cover plate, said cover plate positioned to receive solids being bounced from the sieve by the air current and to have the solids bounce from the cover plate to the sieve; and

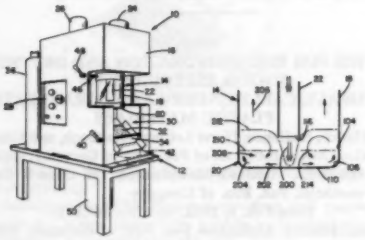
an outlet means for receiving solids bounced from the sieve after having been bounced from the cover plate, said outlet means being positioned adjacent to the other end of the cover plate whereby the solids being bounced by the air current from the sieve to the cover plate, from the cover plate to the sieve and from the sieve to the outlet means throw off water.

4,489,506

MATERIAL TREATMENT

Ernest C. Brown, Danvers; Walter E. Buske, Amesbury, both of Mass., and Norman A. Putnam, Bethel, Me., assignors to Wolverine Corporation, Methuen, Mass.

Filed Sep. 30, 1982, Ser. No. 431,399
Int. Cl.³ F26B 9/08
U.S. Cl. 34—57 A **27 Claims**



1. Coffee bean roasting apparatus comprising

a supply plenum,

a roasting chamber depending from said supply plenum, said roasting chamber including a cylindrical wall and a planar base in fixed relation to said cylindrical wall,

a single inlet tube coaxially disposed in said chamber and extending downwardly from said supply plenum, and an outlet port adjacent the top of said roasting chamber,

means for flowing fluid through said supply plenum exclusively into said tube for discharge as a high velocity column against said planar base and deflection radially outward for upward flow at lower velocity and exhaust through said outlet port, said high velocity column of fluid producing fluidization and toroidal recirculation of a charge of coffee beans in said chamber, and

heater means for heating said fluid to a predetermined coffee bean roasting temperature whereby heat is transferred to the coffee beans in said chamber by thermal convection from said high velocity column and by conduction between individual coffee beans to provide uniform roasting of said coffee beans.

4,489,507

DRYING APPARATUS

Tsuneo Kawai, Toyota, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 18, 1982, Ser. No. 409,347
Claims priority, application Japan, Oct. 9, 1981, 56-162181
Int. Cl.³ F26B 21/02
U.S. Cl. 34—77 **15 Claims**

1. A drying apparatus comprising:

an outer box sealed substantially air-tightly,

drum means rotatably arranged in the outer box for housing materials to be dried,

driving means for rotating the drum,

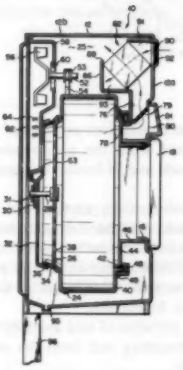
air supply means for supplying air into the drum to remove moisture from the materials, and

heat exchanger means for cooling discharged air which has taken away moisture from the material and has been discharged from the drum by bringing outside air into heat exchange relationship with the discharged air to remove moisture from the discharged air, the supply means supplying air discharged from the drum into the drum through the heat exchanger and supplying outside air into the heat exchanger, wherein

said heat exchanger comprises at least one assembly including:

(a) first, second and third plates, the first and third plates facing the second plate and separated therefrom by a predetermined dimension,

(b) a pair of first opposing closing plates disposed between



the first and second plates to form a first passage therebetween through which air discharged from the drum flows,

(c) a pair of second opposing closing plates disposed between the second and third plates to form a second passage therebetween which extends at right angles to the first passage and through which the outside air flows, heat being exchanged through the second plate between the discharged air flowing in the first passage and the outside air flowing in the second passage,

the assembly being so arranged in the outer box such that the first, second and third plates vertically extend parallel with one another and such that the first passage is inclined by a predetermined angle relative to the vertical direction to allow water drops, which form on the first and second plates by virtue of the heat exchange between the discharged air and outside air, to flow by gravity along the first and second plates opposite the airflow in said first passage, and wherein said apparatus further comprises

means arranged under the heat exchanger to receive the water drips.

4,489,508

VAPOR CONDENSATION APPARATUS HAVING CONDENSER COIL MODULES

Roy C. Carlson, Jr., Boxford, Mass., and Edward J. March, Yardley, Pa., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,729
Int. Cl.³ F26B 9/06
U.S. Cl. 34—78 **9 Claims**

1. Vapor condensation apparatus, which comprises:

a primary vapor zone assembly, a secondary vapor zone

assembly and a hood assembly mounted in separable, vertically stacked relationship;

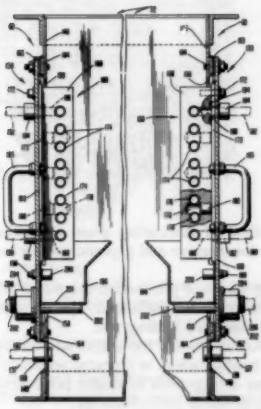
each of the primary and secondary vapor zone assemblies comprising a separate housing having at least one opening in an essentially vertical wall of the housing, the primary vapor zone assembly housing also having an open upper end in communication with an open lower end of the secondary vapor zone assembly housing, and the secondary vapor zone assembly housing also having an open upper end in communication with an open lower end of a housing of the hood assembly; and

condenser coil modules removably mounted on respective ones of the essentially vertical walls of the primary and secondary vapor zone assembly housings;

each of the condensor coil modules including:

(a) a mounting plate having an interior section and an exterior section extending peripherally about the interior section;

(b) releasable securing means for securing the peripherally extending exterior section of the mounting plate to the essentially vertical wall of the respective housing such



that the interior section of the mounting plate covers the opening in the essentially vertical wall, the mounting plate also having an inner side facing toward the housing and an outer side facing away from the housing;

(c) condenser coil means mounted on the interior section of the mounting plate on the inner side of the mounting plate for conducting a cooling fluid within the housing, the condenser coil means being of a size such that the condenser coil means can be removed from the housing through the opening in the essentially vertical wall of the housing when the mounting plate is removed from the housing, without removing the condenser coil means from the mounting plate;

(d) inlet means for introducing the cooling fluid into an inlet end of the condenser coil means, the inlet means extending through the mounting plate from the inner side to the outer side of the mounting plate; and

(e) outlet means for conducting the cooling fluid from an outlet end of the condenser coil means, the outlet means also extending through the mounting plate from the inner side to the outer side of the mounting plate.

4,489,509

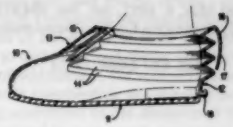
OVERSHOE

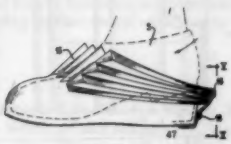
Sidney M. Libit, 441 Lakeside Ter., Glencoe, Ill. 60022

Filed Sep. 28, 1983, Ser. No. 536,696

Int. Cl.³ A43B *3/16, 3/18*

U.S. Cl. 36—7.1 R **10 Claims**





1. A step-in type overshoe composed of a molded plastic material, said overshoe in its relaxed condition having a plurality of accordion-type pleats formed therein with their fold lines being generally horizontal, said overshoe having a flexible instep area arranged to be deformed upon receiving the toe of a shoe, and latching means releasably compressing the rear end of said accordion-type pleats to permit seating of said shoe within said overshoe.

4,489,510

FRICTION SOLED SHOE SLIPPER

Robert M. Williams, 1155 Sharie La., Green Bay, Wis. 54304

Filed Sep. 3, 1982, Ser. No. 414,943

Int. Cl.³ A43B *13/14*

U.S. Cl. 36—103 **8 Claims**

1. A foot cover for releasable attachment to a foot for providing firm footing on a slippery surface, comprising a multiple pad sole including a plurality of pads secured in an overlapping relationship and defining a bottom sole adapted to substantially underlie the sole of a foot, a shell means adapted to be releasably secured over the foot, and means interconnecting of the pads and the shell to define an integrated structure for releasable attachment in a covering relationship over the foot with said multiple pad sole defining the supporting bottom sole.

4,489,511

HEATED PRE-DRYING CYLINDER FOR A STEAM-TROUGH MANGLE

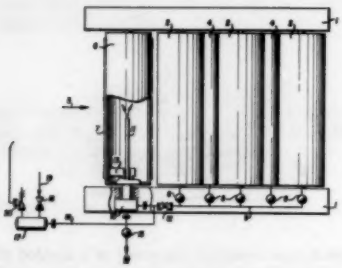
Gerhard Lippold; Günther Thurner, and Georgi Stojanow, all of Karl-Marx-Stadt, German Democratic Rep., assignors to VEB Kombinat Textima, Karl-Marx-Stadt, German Democratic Rep.

Filed Mar. 4, 1982, Ser. No. 354,871

Claims priority, application German Democratic Rep., Jul. 20, 1981, 2319103

Int. Cl.³ D06F 71/34

U.S. Cl. 38—55 9 Claims



1. A laundry ironing system, comprising

(A) a cylinder for pre-drying laundry to be ironed,

(B) at least one mangle cylinder and trough unit for ironing said laundry, said mangle cylinder rotatably mounted and drivable, and said mangle trough remaining stationary and partially encircling said mangle cylinder, said mangle cylinder and trough unit receiving a flowable heat carrier medium in the form of live steam supplied from a source outside of said mangle cylinder and trough unit to dry the laundry while the laundry passes through the mangle cylinder and trough unit, and

(C) means for conveying the condensate of the steam under pressure from said mangle cylinder and trough unit directly to said pre-drying cylinder, in which said condensate of the steam under pressure is depressurized within said pre-drying cylinder to generate flash steam therein, said flash steam precipitating on the internal surface of said pre-drying cylinder on condensation, and heating said pre-drying cylinder.

4,489,512

ARTICLE FOR FORMING A PICTURE FRAME

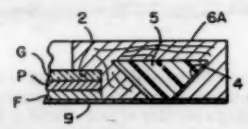
John R. Schovee, 10 Burr Oak Dr., Pittsford, N.Y. 14534

Continuation of Ser. No. 193,809, Oct. 3, 1980, Pat. No. 4,391,054. This application Sep. 30, 1982, Ser. No. 429,174

The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.

Int. Cl.³ A47G 1/06; B32B 31/18

U.S. Cl. 40—154 30 Claims



24. In a method of making frames from a plurality of wood frame sections comprising:

(a) providing a length of wood frame molding having fusible bonding material extending into said wood at an adjacent corner edge to be formed;

(b) cutting said molding across said fusible bonding material at said adjacent corner edge;

(c) abutting a plurality of sections of said molding at said adjacent corner edges thereof;

(d) fusing the abutting adjacent corner edges of said sections together to form corners, whereby said sections of molding are held together to form a frame.

4,489,513

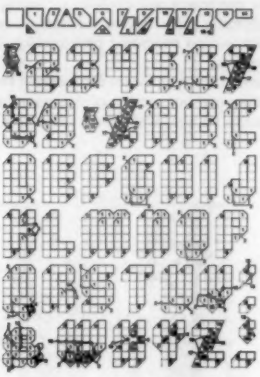
MULTIPLEX SIGN INDICIA

Jack L. Reiner, 508 Luella Ave., Calumet City, Ill. 60409

Filed Nov. 24, 1982, Ser. No. 432,265

Int. Cl.³ G09F 9/30

U.S. Cl. 40—447 10 Claims



1. A method of fabricating giant, specialized sign indicia suitable for inexpensive and gigantic promotional signs which comprises:

arranging stacks of pre-formed shapes of thin material into fixed assembly and sufficiently spaced to provide capability for simplified folding; and

flexibly connecting the top shapes and removing a self-contained configuration, in repeated sequence, whereby only one easy arrangement of shapes per character is required to mass produce each character.

4,489,514

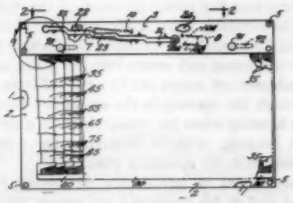
MOTORIZED SIGN WITH SLIDING PANELS

James J. Honse, P.O. Box 6650, Portland, Oreg. 97228

Filed Aug. 19, 1982, Ser. No. 409,448

Int. Cl.³ G09F 11/00

U.S. Cl. 40—476 10 Claims



1. A sign having sequentially displayed panels comprised of strips interleaved with the strips of adjacent sign panels, said sign comprising,

a base including guide means defining an elongate opening,

panels movably supported on the sign base and each includ-

ing a multitude of strips with the strips of each panel rendering a composite display when visible, said panel strips being interleaved with the strips of the remaining sign panels,

a panel drive mechanism including a motor and a continuous member driven by said motor and having a pair of runs, an arm carried by said continuous member, means coupling said arm to said continuous member and imparting movement to said arm for reciprocal travel along the guide means opening with each direction of arm travel associated with one run of the continuous member,

said panels defining openings within which said arm travels with abutments on said panels partially defining the panel openings, and

said guide means including inclined surfaces at intervals along said guideway opening whereby said arm will be guided out of contact with an abutment on one panel for subsequent contact with an abutment on a remaining panel to cause repositioning of said one panel and its strips to change a display of the sign.

4,489,515

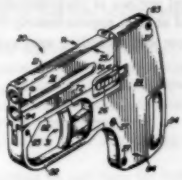
CONCEALABLE FIREARM

Jody L. Numbers, 7908 E. Oak, Scottsdale, Ariz. 85257

Filed Mar. 21, 1983, Ser. No. 477,263

Int. Cl.³ F41C *3/00, 9/00, 19/00*

U.S. Cl. 42—1 R **1 Claim**



1. A firearm comprising

(a) a frame including a handle portion and having at least two generally parallelably opposed spaced members defining

(i) in part first and second side surface areas of said firearm, and

(ii) an internal space therebetween,

said spaced opposed members generally lying in a pair of opposed, spaced, parallel imaginary planes,

(b) a barrel pivotally connected to said frame and

(i) having a chamber for receiving a cartridge, said chamber having a cylindrically shaped inner wall,

(ii) having a bore through which a bullet fired from said cartridge travels, and

(iii) movable between at least two operative positions,

first operative position in which said firearm can be fired, and

a second operative position in which a cartridge can be manually loaded into said chamber;

(c) a hammer pivotally carried on said frame and at least partially positioned in said internal space;

(d) a trigger carried on said frame and operatively associated with said hammer, said trigger being manually depressed to pivotally displace and release said hammer;

(e) spring means mounted on said frame and operatively associated with said hammer;

(f) firing pin means carried on said hammer, said hammer and firing pin means being movable between at least two operative positions,

(i) a normal operative position with said hammer at rest in a state of equilibrium with said trigger and said spring means, and

(ii) an operative position with said hammer pivotally displaced from said normal operative position and maintained by said trigger in a cocked position such that after said trigger releases said hammer, said compressed spring means forces said hammer to pivot on said frame such that said firing pin means strikes and fires a cartridge carried in said chamber;

said barrel and handle portion having surfaces defining in part said first and second side surface areas of said firearm, said barrel and handle surfaces generally lying in said opposed imaginary planes with said spaced member of said frame,

said barrel having a minimum barrel wall thickness represented by the shortest of the distances from said cylindrical wall of said chamber to said surfaces defining said first and second side surface areas of said firearm, the shortest distance between said imaginary planes representing the greatest width of said firearm and being equivalent to the diameter of said inner wall of said chamber added to twice said minimum barrel wall thickness,

said minimum barrel wall thickness generally being at least sufficient to prevent significant damage to the barrel when said firearm is fired for the first time, said significant damage to the barrel preventing further use of said firearm.

4,489,516

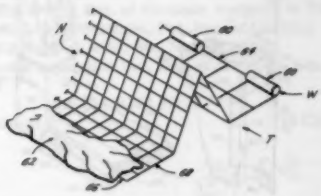
SNAKE TRAP

Albert B. Moorhead, P.O. Box 413, Conroe, Tex. 77301

Continuation-in-part of Ser. No. 128,399, Mar. 10, 1980, Pat. No. 4,370,823. This application Sep. 30, 1982, Ser. No. 430,662

Int. Cl.³ A01K *69/02*

U.S. Cl. 43—7 **11 Claims**



6. A method for excluding snakes from a region comprising the steps of:

shaping an area of netting so that when said area of netting is placed on the ground a plurality of sides of said area of netting are substantially non-horizontal to the ground;

releasably securing the netting to the ground with weights mounted on the netting for placement on the ground so that the netting will move transversely over the ground in response to a struggling force of a snake being trapped; and,

closing the perimeter of said region with said area of netting.

4,489,517

REVERSIBLE DOOR AND FRAME ASSEMBLY

William S. Young, Plymouth, Ind., assignor to Twin Y Corporation, Ligonier, Ind.

Filed Sep. 30, 1982, Ser. No. 431,267

Int. Cl.³ E05D *7/02*

U.S. Cl. 49—382 **17 Claims**

1. A reversible door and frame assembly adapted for inertion into a door opening defined by laterally spaced generally vertical jamb members or the like and a substantially horizontal header member or the like, said door and frame assembly comprising, in combination,

an elongated hinge frame member having at least two hinge plates fixed thereto in symmetrical relation to the longitudinal midpoint of said hinge frame member and defining a hinge axis,

an elongated lock frame member of substantially equal length to said hinge frame member, said lock frame member having a generally planar web surface in which is

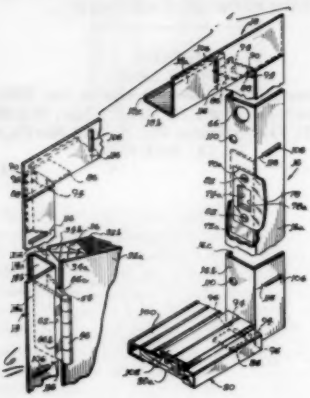
formed a pair of substantially rectangular openings in symmetrical relation about the longitudinal midpoint of said lock frame member,

a mounting plate fixed to said lock frame member rearwardly of each of said rectangular openings,

a striker plate and a cover plate adapted to be releasably and interchangeably mounted on said mounting plates within said rectangular openings so as to lie in substantially coplanar relation with the outer surface of said web surface,

a head frame member having opposite ends adapted for releasable interconnection to either end of said hinge frame and lock frame members in a manner to establish substantially fixed lateral spacing between said hinge frame and lock frame members,

and a door having laterally opposite longitudinal edge surfaces at least one of which defines an outwardly extending flange having a plurality of transverse recesses formed therein each of which is adapted to receive a hinge plate in mounted relation therein in a manner enabling reversal of



the hinge plates for hinge cooperation with said hinge plates on said hinge frame member so as to enable hinged mounting of said door thereon, the opposite lateral edge of said door member having a latch mechanism mounted thereon spaced a predetermined distance from the midpoint of said opposite lateral edge for substantially horizontal alignment with one of said substantially rectangular openings in said lock frame member,

said hinge frame member and said lock frame member having substantially identical opposite ends and being reversible end for end so as to enable reversible mounting within said door opening, said hinge plates on said door being reversible to enable reversible mounting of said door on said hinge frame member with said latch mechanism in alignment with one of said rectangular openings in said lock frame member so that interchanging the positions of said striker plate and said cover plate enable releasable locking of said door in a closed position when mounted for either right-hand or left-hand opening.

4,489,518

SEALING ARRANGEMENT FOR TILTABLE AND PIVOTAL WINDOWS

Knud E. Nissen, Hornsyld, and Erik S. Berneke, Copenhagen, both of Denmark, assignors to V. Kann Rasumussen Holding A/S, Søberg, Denmark

Filed Feb. 1, 1984, Ser. No. 575,892

Claims priority, application Denmark, Feb. 14, 1983, 630/83

Int. Cl.³ E06B *1/00*

U.S. Cl. 49—392 **2 Claims**

1. A window having a stationary rectangular frame including four frame members, a sash having corresponding sash members and being swingable around an axis extending parallel to and located intermediate an opposed pair of said frame members, and at least one weather strip to improve the tightness between said frame and said sash in the closed position of the window, each of the frame and sash members extending perpendicular to said axis presenting abutment surface sections facing in opposite directions on either side of the axis, said

abutment surface sections of the frame members as well as those of the sash members merging smoothly into each other via a substantially helically wound abutment surface section having its centre, represented by the point at which the generatrix of the helical surface is perpendicular to the plane of the window, located at least approximately in a plane perpendicular to the window and including said axis.

4,489,519

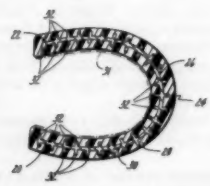
EDGE GUARD

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed Sep. 19, 1983, Ser. No. 533,688

Int. Cl.³ B60J *5/00*

U.S. Cl. 49—462 **13 Claims**



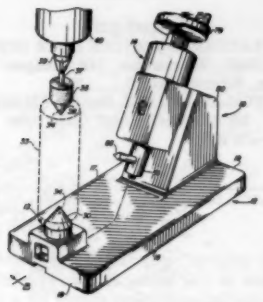
1. An edge guard of general U-shaped cross section for fitting onto an edge, said edge guard comprising an insert having a general U-shaped cross section corresponding to the U-shaped cross section of the edge guard and non-metallic material encapsulating said insert, said insert having a regular sculptured form throughout the extent of the U so as to provide stiffening to the edge guard and with the non-metallic material interlocking with the sculpturing of the insert and in which said sculptured insert comprises a main U-shaped web corresponding to the general U-shape of the cross section and said web comprising means defining longitudinal fluting providing said sculptured form, said means defining longitudinal fluting, when viewed in transverse cross section, being open toward the interior of the U and extending interiorly from said web.

4,489,520

MACHINE TOOL ATTACHMENT

Brandt G. Brown, Phoenix, Ariz., assignor to Robert R. Griese, Tempe, Ariz.

Filed Jul. 30, 1981, Ser. No. 288,657
Int. Cl.³ B24B 15/00
U.S. Cl. 51—5 D 7 Claims



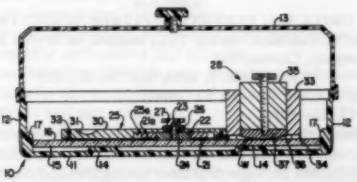
1. In a machine tool including,
a work supporting surface,
rotatable tool holding means, and
lapping means carried by said tool holding means and having a conical surface,
an attachment for said machine tool for supporting a workpiece, said workpiece having a pair of opposed centers, while said lapping means is operated upon one of said centers and for alternately dressing and truing said lapping means, said attachment comprising:
a. a base securable to the work supporting surface of said machine tool;
b. center means carried by said base for holding and bracing said workpiece; and
c. tool means carried by said base for dressing and truing said lapping means, said center means and said tool means being alternately and selectively alignable with said lapping means.

4,489,521

APPARATUS FOR ABRADING WORKPIECES, PARTICULARLY SEMICONDUCTOR WAFERS

Robert G. Mazur, Monroeville, Pa., assignor to Solid State Measurements, Inc., Monroeville, Pa.

Filed Jun. 16, 1982, Ser. No. 388,747
Int. Cl.³ B24B 7/08
U.S. Cl. 51—161 7 Claims



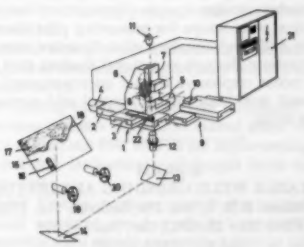
1. Apparatus for abrading a workpiece, said apparatus comprising:
an abrading plate having an abrading surface and provided with a generally central upstanding pivot support, said pivot support including a collar secured to said abrading plate to extend above said abrading surface,
means for supporting said abrading plate with said abrading surface in a generally upright orientation,
a drive arm including a disc to engage said collar for rotary support by said pivot support such that a driven arm portion thereof extends radially from said pivot support, releasable fastening means for holding said disc at one of different positions on the drive arm to preselect a circular track for a workpiece along the abrading plate,
a workpiece holder including an annular housing having a central through bore and a plunger which is axially slideable within said through bore, said plunger including a lower surface for carrying a workpiece,
said driven arm portion including fingers extending into a circular recess for nonrotatably retaining said annular housings in the circular recess in an orientation such that vertical floating movement of said plunger in said housing gravitationally maintains a workpiece carried by said lower surface of said plunger in contact with said abrading surface,
said drive arm including means engageable with said abrading plate for maintaining a generally parallel relation between said drive arm and said abrading plate to thereby maintain the axis of said through bore generally perpendicular to said abrading surface, and
means for imparting a horizontal rotary motion to said drive arm for rotation thereof about said pivot support.

4,489,522

METHOD AND DEVICE FOR THE STORAGE OF SELECTED POINTS OF A NOMINAL CONTOUR LINE IN A PROJECTION PROFILE GRINDER

Roland Henseleit, Wertheim, and Carl-Joachim Kolb, Külsheim-Tiefental, both of Fed. Rep. of Germany, assignors to Präzisions-Technik GmbH, Wertheim, Fed. Rep. of Germany

Filed Sep. 9, 1982, Ser. No. 416,529
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136241
Int. Cl.³ B24B 49/12
U.S. Cl. 51—165.71 10 Claims



4. Projection profile grinder comprising a holder for a workpiece, a grinding wheel for grinding a desired profile into a workpiece on the holder, a carrier for causing relative displacement between the holder and the grinding wheel, a projection screen, means for projecting an image of the grinding wheel onto the projection screen, means for displaying a desired contour line on the projection screen corresponding to a desired profile to be ground into a workpiece on the holder by operation of said carrier, a CNC system for controlling the grinder operation during a grinding operation, manual control means for manually controlling the carrier at times when automatic operation is not being conducted, and position sensing means associated with the carrier for providing carrier position information to the CNC, characterized in that a marker is provided on the carrier in predetermined relation to the grinding wheel, an image of the marker is projected onto the projection screen, the CNC has stores for storing data from said position sensing means, and means are provided for causing position information from said position sensing means to be stored in stores of said CNC as the carrier is operated by said manual means to selected positions defined by the positioning

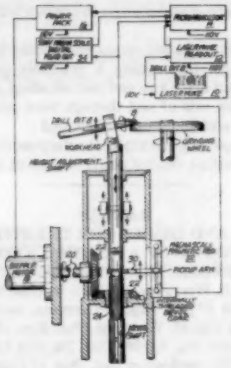
of the image of said marker at selected points of said contour line with the corresponding information from said position sensing means at each of said selected points being caused to be stored.

4,489,523

APPARATUS FOR REGRINDING STEP DRILLS

Frank R. Webster, Tukwila, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 375,800, Mar. 10, 1982, Pat. No. 4,475,320.
This application Nov. 21, 1983, Ser. No. 553,602
Int. Cl.³ B24B *49/04*
U.S. Cl. 51—165.72 **1 Claim**



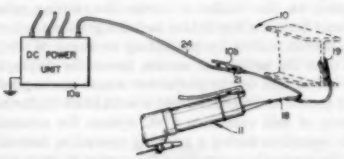
1. A drill bit pointer machine having a workhead stop for regrinding step drills comprising in combination:
   a microprocessor;
   a digital readout device;
   a laser optical microscope for measuring pilot diameter of said step drills and coupling pilot diameter data to said microprocessor through said digital readout device; and,
   a stepper motor responsive to said microprocessor for adjusting said workhead stop to control said regrinding of said step drills.

4,489,524

PORTABLE WELD GRINDING APPARATUS

Ronald E. Watson, R.R. 5, Box 299, Sullivan, Ind. 47882

Filed May 28, 1982, Ser. No. 382,689
Int. Cl.³ B24B *23/00*
U.S. Cl. 51—170 R **1 Claim**



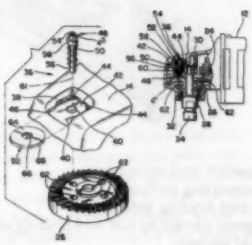
1. In combination:
   a direct current power unit designed and arranged for arc welding having a plurality of weld cables each fitted with an electrode clamp at its distal end, said clamps being of conventional construction including an interior conductive portion suitable to establish electrical continuity between said direct current power unit and any electrode held within said electrode clamp; and
   a hand-held, portable weld grinder including a weld grinding wheel and a direct current motor for providing rotary motion to the weld grinding wheel, said portable weld grinder including a dual-lead electrical cable connected at a first end to said portable weld grinder and including at the opposite end a pair of leads, the first lead of said pair being suitably adapted to be retained within said electrode clamp and the second lead being adapted to establish said ground connection.

4,489,525

REPLACEABLE SPINDLE LOCK SYSTEM

Edward A. Heck, Westminster, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Aug. 11, 1983, Ser. No. 522,010
Int. Cl.³ B24B *23/00*; G05G *5/06*
U.S. Cl. 51—170 R **21 Claims**



1. A locking system for a power tool, comprising:
   (a) a housing;
   (b) a driven element operatively connected to the housing;
   (c) a lock member removably connected to the housing and engageable to lock the driven element against motion relative to the housing;
   (d) retaining means accessible from outside the housing for releasably maintaining the lock member connected to the housing;
   (e) the housing defining an external recess open at one end thereof and a lock channel formed therein:
   (f) the lock member being an elongated body slideably movable in the lock channel;
   (g) the retaining means including a retaining member defining an aperture selectively engageable with the lock member; and
   (h) the retaining member being slideably movable in the recess and being selectively removable from the recess open end responsive to disengagement of the lock member from the retaining member aperture.

4,489,526

DRILL RIG ELEVATING FLOOR STRUCTURE

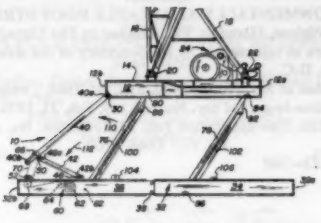
Bruce M. Cummins, Spring, Tex., assignor to Skytop Brewster Company, Conroe, Tex.

Filed Mar. 8, 1983, Ser. No. 473,237
Int. Cl.³ E04H *12/34*
U.S. Cl. 52—125.6 **9 Claims**

1. In an oil well drilling rig having a base for placement on the ground at a well site, the base having first and second ends, the rig further having a drill floor having first and second ends, the floor being disposed parallel to and adjacent the first end of the base, the floor additionally being coupled to the base by spaced apart parallel legs each pivotally attached between the floor and the base for elevating the floor from a low position adjacent to the first end of the base to an elevated position medially between the ends of the base and located above the base by rotation of the legs towards a vertical position, the improvement comprising:
   tensile link means having first and second ends, said first end

thereof being coupled adjacent the second end of the floor opposite the first end of the base;

thrust link means having first and second ends, said first end thereof being coupled adjacent said second end of said tensile link means and said second end thereof being pivotally coupled adjacent the second end of the base; and



power driven means connected to the base and said link means for drawing said second end of said tensile link means to a pin linkage position on the base adjacent the second end of the base as the legs approach the vertical position.

4,489,527

LIFT LANDING DOOR FRAME ARRANGEMENT

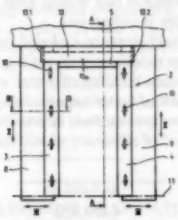
Max Haas, Kriens, Switzerland, assignor to Inventio AG, Hergiswil, Switzerland

Filed Jul. 18, 1983, Ser. No. 514,923

Claims priority, application Switzerland, Aug. 3, 1982, 4672/82

Int. Cl.³ E06B *1/04*

U.S. Cl. 52—217 **9 Claims**



1. A lift landing door frame arrangement comprising:

a door frame intended to be operatively associated with a landing opening in a lift shaft;

said door frame comprising uprights;

a respective horizontally adjustable lateral caulking element arranged at each one of said uprights;

each said lateral caulking element comprising a substantially rectangular sheet metal panel of a length exceeding the height of said door frame;

each said panel engaging its related upright at an inner side thereof;

a respective guide plate provided for each of said uprights and guiding a related one of said panels;

each guide plate possessing a number of oblong openings;

each panel possessing a number of oblong openings;

said oblong openings of said guide plates and said oblong openings of said panels being arranged to extend substantially crosswise with respect to each other in the assembled state of said guide plate and its related panel;

fixing means for horizontally and vertically adjustably connecting each panel to its related guide plate;

a crosspiece arranged at an upper region of said door frame;

a top caulking element arranged at said upper region of said door frame and comprising a substantially U-shaped strap;

said strap being bent at opposite ends thereof to define bent limbs; and

said strap being arranged astride a front part of the door frame and being laterally guided at said door frame by means of said bent limbs.

4,489,528

CAGE SPACER

Wilbur E. Tolliver, 364 Hamilton, Holland, Mich. 49423

Filed Aug. 18, 1982, Ser. No. 409,321

Int. Cl.³ E04C *5/16*

U.S. Cl. 52—677 **43 Claims**

1. A spacer for use with first and second concrete reinforcing members in the manufacture of reinforced concrete articles to space said first and second members one from the other, said first member including a plurality of first wires and said second member including a plurality of second wires, said spacer comprising:

a spacing member having first and second ends;

a first camming member extending from said first end adapted to cammingly engage only one side of one of said first wires;

a second camming member extending from said second end adapted to cammingly engage only one side of one of said second wires;

a first locking portion operatively connected to said first camming member adapted to extend about the remaining sides of said one first wire to aid in preventing said spacer from being inadvertently dislodged from said one first wire; and

a second locking portion operatively connected to said second camming member adapted to extend about the remaining sides of said one second wire to aid in preventing said spacer from being inadvertently dislodged from said one second wire.

4,489,529

REINFORCED CEILING RUNNER

James C. Ollinger, and Melvin H. Shaub, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jan. 17, 1983, Ser. No. 458,339

Int. Cl.³ E04C *3/30*

U.S. Cl. 52—732 **1 Claim**

1. An inverted T-bar runner structure for suspended ceilings comprising:

(a) an inverted T-shaped runner member having a vertical web with two horizontal flanges at the base of the web with one of each horizontal flange disposed perpendicularly on each side of the vertical web,

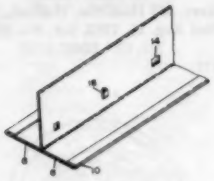
(b) the vertical web being formed of two pieces of material side by side with the runner being formed from a single piece of material and the single piece of material being bent at the top of the vertical web so that the two pieces of material forming the vertical web are joined together at the top of the vertical web, but are normally unjoined at

the base of the vertical web where the horizontal flanges extend outwardly from the vertical web,

(c) a strip of material positioned against the underside of the horizontal flanges with the edges of the strip of material extending around and slightly over the outer edges of the horizontal flanges, and

(d) the improvement comprising:

(1) providing a series of vertical lances in the region of the base of the vertical web to fasten together the two



pieces of material forming the vertical web in the region about ¼" above the base of the vertical web adjacent where the horizontal flanges are formed, said lances being spaced about 2" apart, and

(2) said lances being formed by displacing a portion of the one piece of material forming the vertical web into the plane of the other piece of material forming the vertical web to mechanically bond the two pieces of material together.

4,489,530

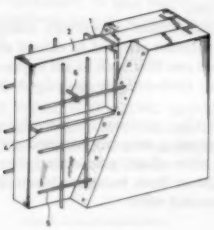
SANDWICH WALL STRUCTURE AND THE METHOD FOR CONSTRUCTING THE SAME

Chi Ming Chang, 5Fl., 22, Ln. 618, Min Chuan East Rd., Taipei, Taiwan, Taiwan

Filed Dec. 23, 1981, Ser. No. 333,795

Int. Cl.³ E04F *13/04*; E04G *21/12, 21/00*

U.S. Cl. 52—741 **10 Claims**



1. A method for constructing a wall having a core of light, resilient, heat-insulating material with a framework of metallic bars and two wire-reinforced crusts of concrete at both sides of said core, comprising:

vertically erecting a plurality of metal channel bars, each of which defines at least one channel and has wings extending transversely distally a small distance along its entire length, in spaced relationship to construct a substantially planar framework and fixing the framework to a horizontal surface structure of a building; filling empty spaces thus defined between said spaced bars with pieces of light, resilient heat-insulating material, with an edge of each said insulating piece fitted in one of said channels; mounting a plurality of transverse members to said wings of each of two adacent channel bars over outside of surface of said insulating pieces mounting wire panels onto opposite sides of said insulating pieces with a clearance between the wire panel and the insulating pieces defined by said wings of said channel bars and said transverse members;

grouting the two pannelled sides to form said two wire-reinforced concrete crusts on both sides of said insulating pieces.

4,489,531

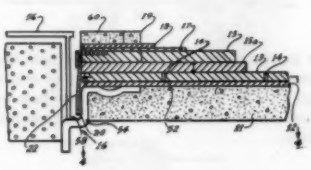
ENVIRONMENTALLY ADAPTABLE ROOF STRUCTURE

Nyal E. Nelson, Herndon, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 164,490, Jun. 30, 1980, , which is a continuation-in-part of Ser. No. 013,109, Feb. 21, 1979, Pat. No. 4,397,126. This application Feb. 23, 1983, Ser. No. 451,992

Int. Cl.³ E04B *7/00*

U.S. Cl. 52—741 **1 Claim**



1. A method for maintaining the insulation in a roof structure having at least one layer of insulation enclosed in a water vapor impermeable envelope with closeable water and water vapor vents in a dry condition comprising the steps of:

(a) opening said vents during the winter season when the humidity is low thereby drying said insulation layer by permitting moisture to pass out of said insulation by drainage, evaporation and sublimation;

(b) closing said vents in late Winter after an extended period of low humidity weather; and

(c) maintaining said vents in a closed condition during the humid Summer months to prevent ingress of water vapor, with the attendant build-up of water within the insulation layers as a result of water vapor condensation when dew-point conditions are reached, into said insulation whereby the highest level of efficiency of said insulated roof may be maintained.

4,489,532

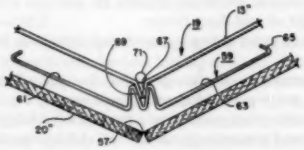
ALUMINUM SHINGLE ACCESSORIES

Billy H. Ellis, No. 4 Edgehill Rd., Joshua, Tex. 76058, and Randall Ellis, 7505 Ridgeway, Fort Worth, Tex. 76180

Division of Ser. No. 260,001, May 4, 1981, Pat. No. 4,411,120. This application May 10, 1983, Ser. No. 493,153

Int. Cl.³ E04D *1/00*

U.S. Cl. 52—748 **1 Claim**



1. An improved method of installing metal shingles at a valley of a roof, comprising:

providing a metal valley base with two flat portions located at an obtuse angle with respect to each other and separated by an upwardly facing channel;

mounting the valley base over the valley, with the channel in the same vertical plane as the valley center;

bending the sides of adjoining shingles at the valley downwardly and inserting the sides into the channel in contact with each other; and

securing the adjoining shingles to the roof and placing sealant into the junction of the adjoining shingles.

4,489,533

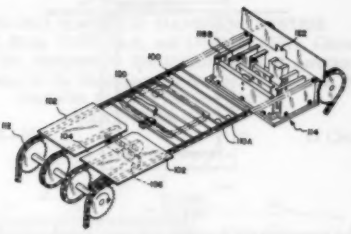
PACKAGE HANDLING IN A FILM WRAPPING MACHINE

Fritz F. Treiber, Centerville, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Dec. 6, 1982, Ser. No. 446,911

Int. Cl.³ B65B *11/06*

U.S. Cl. 53—228 **20 Claims**



1. In a high speed film wrapping machine wherein a trayed commodity is transported horizontally to a wrapping station on a horizontal conveying platform which travels beyond the wrapping station with the trayed commodity being deposited at the wrapping station by collision with a package stop, the package handling improvement comprising:

projection means coupled to said conveying platform for catching said trayed commodity upon rebound from said package stop due to the resiliency of the tray supporting said commodity and the collision with said stop and for urging said trayed commodity toward said stop whereby said trayed commodity is more accurately positioned at said wrapping station.

4,489,534

APPARATUS FOR FILLING TRAYS WITH CIGARETTES OR THE LIKE

Rolf Gömann, Dassendorf, and Lothar Krause, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

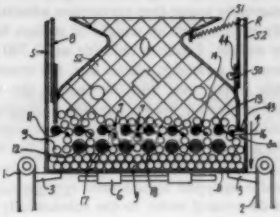
Continuation of Ser. No. 232,252, Feb. 6, 1981, abandoned. This application Jun. 13, 1983, Ser. No. 503,701

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1980, 3005079

Int. Cl.³ B65B *19/04*

U.S. Cl. 53—151 **16 Claims**

1. Apparatus for admitting cigarettes or analogous rod-shaped articles into trays of the type having a bottom wall and additional walls extending upwardly from the bottom wall, comprising means for lowering a tray which is to be filled from a raised position to a lower position; a magazine arranged to store a supply of parallel articles and having an outlet portion disposed in the interior of and close to the bottom wall of a tray in said raised position, said outlet portion having a plurality of ducts for admission of articles from said supply into the interior of the tray into which said outlet portion extends and first wall members bounding said ducts, said ducts having lower end portions and said first wall members being so closely adjacent to the lower end portions of the respective ducts that the articles which descend beyond said first wall members are disposed at a level below said ducts and encounter no additional obstructions on their way into the tray into which said outlet portion extends; and drive means for imparting to said first wall members recurrent back-and-forth movements transversely of the direction of advancement of articles through said ducts to impart to the descending articles a sidewise movement while the articles advance through said ducts.



4,489,535

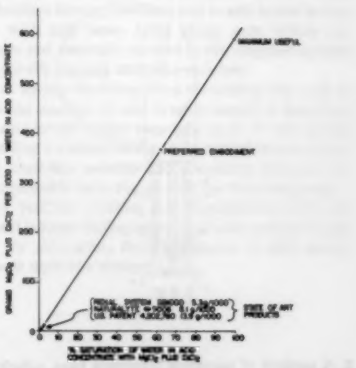
MATERIALS AND METHOD FOR PREPARING DIALYSIS SOLUTIONS CONTAINING BICARBONATE IONS

Preston L. Veltman, 212 Old Country Rd., Severna Park, Md. 21146

Continuation-in-part of Ser. No. 193,125, Oct. 2, 1980, which is a continuation-in-part of Ser. No. 123,355, Feb. 21, 1980, abandoned. This application Jan. 29, 1982, Ser. No. 344,038

Int. Cl.³ A61K *33/14*; B65B *55/18*; C09K *3/00*

U.S. Cl. 53—431 **17 Claims**



1. A method for preparing a bicarbonate dialysis solution, said dialysis solution consisting essentially of: (a) about 120 to 155 m Eq per liter of sodium ions; (b) about 30 to 42 m Eq per liter of bicarbonate ions; (c) about 1 to 5 m Eq per liter of calcium ions; (d) about 80 to 115 m Eq per liter of chloride ions; and (e) water to make one liter, said dialysis solution being prepared by admixing: (A) an acidic concentrated first aqueous solution consisting essentially of an amount of calcium chloride effective for providing about 1 to 5 m Eq of calcium ions per liter of said dialysis solution and an amount of a physiologically acceptable acid effective for causing said dialysis solution to have a pH of 7.2 to 7.4, said acidic concentrated first aqueous solution being free of sodium chloride; and (B) a second aqueous solution consisting essentially of all of the sodium ions and all of the bicarbonate ions present in said dialysis solution and being free of calcium and magnesium salts, said acidic concentrated first aqueous solution and said

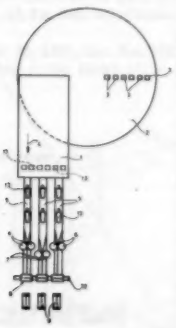
second aqueous solution being admixed with water to form said dialysis solution.

17. A method for preparing about 2 liters of a solution useful for peritoneal dialysis comprising: (a) packaging: (i) about 45.7 grams of a substantially water-free particulate admixture consisting essentially of 589 parts by weight of sodium bicarbonate, 823 parts by weight of sodium chloride and 2,700 parts by weight of dextrose in a flexible plastic bag; (ii) removing air from said flexible plastic bag, and (iii) sealing the resulting substantially air-free flexible plastic bag; (b) packaging about 1.666 ml of an acidic concentrated aqueous solution consisting essentially of 233 grams of calcium chloride per liter, 85 grams of magnesium chloride per liter and 378 grams of lactic acid per liter in a needle-equipped hypodermic syringe; (c) adding about 2 liters of de-aerated water to the substantially air-free flexible plastic bag without introducing air into the bag, and dissolving said water-free particulate admixture in said water; and (d) transferring the aforesaid acidic concentrated aqueous solution from the hypodermic syringe to the solution in said bag and mixing the resulting composition therein to form said solution useful for peritoneal dialysis.

4,489,536
PACKAGING METHOD

Kaj Degn, Hasselager, and Ejvind Waldstrom, Hundslund, both of Denmark, assignors to O. G. Hoyer A/S, Hojbjerg, Denmark

Division of Ser. No. 186,468, Sep. 12, 1980, Pat. No. 4,370,844. This application Sep. 30, 1982, Ser. No. 429,236
The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.
Int. Cl.³ B65B 9/06
U.S. Cl. 53—450 5 Claims

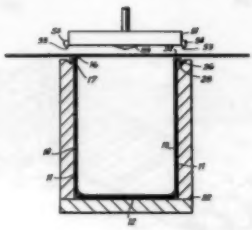


1. A method of wrapping objects in bags, which comprises the steps of advancing several lines of wrapping material in substantially parallel spaced relation to each other, gripping said objects in gripping means and feeding them in successive rows each extending above said lines and transversely thereof, initially releasing from the gripping means and depositing on respective lines only alternate objects in a said row, displacing the remaining gripped objects in said row in one direction transversely of the lines, subsequently releasing and depositing each of said remaining objects on the same line on which was deposited in said initial depositing step an object which was previously adjacent said remaining object, said subsequent depositing being on a different part of said same line than the part thereof occupied by said previously adjacent object, so that each line receives a pair of adjacent objects from each row, folding the lines of wrapping material about the objects from said depositing steps, sealing the folded material lengthwise and crosswise of said lines to form each line into interconnected packages of said objects, and separating the interconnected passages from each other, the number of objects in each said row being a multiple of the number of said lines.

4,489,537
CONTAINER FOR STORING FOOD AND PROCESS AND APPARATUS FOR MAKING THAT CONTAINER

Robert L. Gordon, Monroe; George H. Maugle, Central Valley, both of N.Y., and Keith A. Cooper, Laurel, Md., assignors to International Paper Company, New York, N.Y.

Division of Ser. No. 28,719, Apr. 9, 1979, , which is a division of Ser. No. 745,834, Nov. 26, 1976, Pat. No. 4,155,697. This application Jul. 22, 1982, Ser. No. 400,611
Int. Cl.³ B65B 47/08, 3/02
U.S. Cl. 53—511 7 Claims



1. An apparatus for drawing and blow forming plastic into a paperboard outer container and for heat sealing that container comprising:

(a) a female mold comprising at least one vertical wall and a bottom wall, said female mold adapted to recieve a paperboard outer container;

(b) a male mandrel provided with holes in communication with a source of gas whereby gas may be directed from the interior of said mandrel into said female mold;

(c) means for positioning a sheet of plastic between said female mold and said male mandrel;

(d) means for heating the sheet of plastic positioned between said female mold and said male mandrel in subpart (c) above;

(e) means for positioning the male mandrel with respect to the female mold so that said male mandrel may engage said female mold, said male mandrel and female mold being constructed so that when so positioned with respect to one another and a sheet of plastic is positioned between said male mandrel and female mold, the sheet of plastic may be drawn by said male mandrel into a paperboard outer container positioned in said female mold and, thereafter, the sheet of drawn plastic may be blow formed in the paperboard outer container positioned in said female mold, said male mandrel and female mold being further provided with means for forming at least one horizontal flange connected to and extending outwardly at least about ¼ inch from the drawn and blow formed plastic and at least one vertical flange connected to and extending downwardly at least about ¼ inch from said at least horizontal flange to obtain a container comprising a paperboard outer container, a plastic inner container, at least one horizontal flange and at least one vertical flange;

(f) means for introducing product into the container described in subpart (e) above;

(g) a platen, said platen comprising a heating means and an air displacement block non-movable with respect to the remainder of the platen and projecting downwardly from the platen;

(h) means for positioning a sheet of heat sealable cover material between said female mold and said platen when said female mold and said platen are positioned so that they may engage each other; and

(i) means for positioning said platen with respect to the

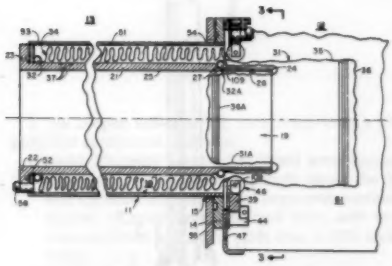
female mold so that said platen may engage said female mold, said platen and female mold arranged and constructed so that (i) when container of the type described in subpart (e) above is positioned in the female mold and a sheet of heat sealable cover material is positioned between said platen and the female mold and the female mold and platen are moved into engagement with each other, the heat sealable cover material may be pressed and heat sealed onto the at least one horizontal flange of the container, and (ii) before the sheet of heat sealable cover material is pressed onto at least one horizontal flange, the ari displacement block of the platen contacts the sheet of heat sealable cover material to push the heat sealable cover material into the interior of the container and to evacuate air from the interior of the container.

4,489,538

BAG-OUT MATERIAL HANDLING SYSTEM

Stephen B. Brak, Tinley Park, and Henry F. Milek, Chicago, both of Ill., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 26, 1982, Ser. No. 352,743
Int. Cl.³ B65B *43/42*
U.S. Cl. 53—576 **12 Claims**



1. A bagging device for transferring material from a first chamber through an opening in a wall to a second chamber, said bagging device comprising:

an outer housing having open proximal and distal ends, said proximal end communicating with said opening;

an inner housing spaced concentrically within said outer housing so as to define an anular space therebetween, said inner housing having open proximal and distal ends so as to define a passage between said first and second chambers and wherein the circumference of the proximal end of said inner housing is smaller than the circumference of the remaining portion thereof;

means for sealably coupling the respective distal ends of said inner and outer housing in sealing said annular space at the distal portion thereof and wherein the proximal end portion of said annular space is open; and

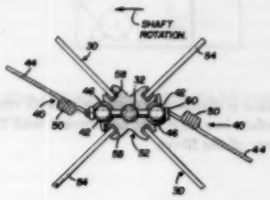
a pliable tube slidably engaged in sealed relationship with said inner housing and disposed thereon within said annular space, said pliable tube including a first closed end portion extending from the open proximal end portion of said annular space and over the proximal end of said inner housing in sealed relation thereto for receiving material from said first chamber through said inner housing, wherein the closed proximal portion of said tube is sealed and severed along said seal in providing a sealed container for handling said material while forming a second closed end portion extending over the proximal end of said inner housing in maintaining isolation between said first and second chambers and wherein the reduced circumference of the proximal end of the inner housing facilitates the removal of the remnants of a used tube and the installation of a replacement tube with the remnants of the used tube discharged into the sealed, installed replacement tube.

4,489,539

SWEEPER AND TURF THATCHER

Mark R. Fralish, Berlin, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Jun. 27, 1983, Ser. No. 508,402
Int. Cl.³ A01D *7/00, 7/06*
U.S. Cl. 56—400.02 **5 Claims**



1. An apparatus for sweeping and thatching turf comprising:

a sweeper brush assembly rotatably supported at its opposite ends within a housing, said brush assembly including a centrally located, longitudinally extending, rotatable shaft-like member, a plurality of spaced apart brush holder elements secured at spaced apart locations along the length of said shaft-like member and a plurality of radially directed brushes having bases secured to said brush holder elements with said bases lying along axes which are spaced from and generally parallel to the longitudinal axis of said centrally located shaft-like member;

a plurality of spring thatching tines secured at one end to said shaft-like member of said brush assembly at locations between said brush holder elements, each of said spring tines including a resilient end portion which is snap-fitted onto said shaft-like member and a radially directed leg portion engageable with the ground for thatching; and

said tine leg portions rotating into engagement with the bases of said brushes during rotation of said sweeper brush assembly for preventing further rotation of said spring tines on said shaft-like member.

4,489,540

PROCESS AND DEVICE FOR OBTAINING A SPUN YARN OF FIBRES COMPRISING AN INTERNAL CORE AND NOVEL TYPES OF SPUN YARNS THUS MADE

Jean-Louis Faure, and Jean Venot, both of Roanne, France, assignors to ASA S.A., Villeurbanne, France

Filed Jan. 17, 1983, Ser. No. 458,702
Claims priority, application France, Jan. 26, 1982, 82 01382; Sep. 17, 1982, 82 15830
Int. Cl.³ D02G *3/38*
U.S. Cl. 57—5 **16 Claims**

1. A process for making a spun yarn of fibres comprising an internal core, comprising the steps of:

(a) positively delivering a yarn forming an internal core,

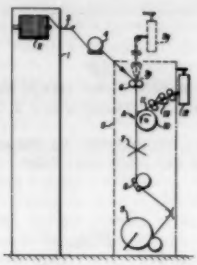
(b) subjecting said core yarn to a momentary false twist,

(c) projecting elementary fibres onto said core yarn, upstream of a false twist spindle,

wherein:

the projection of said elementary fibres onto said core yarn is effected by means of a mobile guide surface on which

said fibres are delivered tangentially and which tends to exert a pulling force on the free end of said fibres, and



said core yarn is displaced tangentially with respect to said guide surface in a direction concurrent with the direction of delivery of the fibres.

4,489,541

YARN PACKAGE AND APPARATUS FOR WINDING COVERED YARN

Terry L. Boling, Taylorsville, N.C., assignor to Southern Elastic Corporation, Sanford, N.C.

Filed Jan. 20, 1983, Ser. No. 505,698
Int. Cl.³ D01H *13/04, 7/90, 7/04*
U.S. Cl. 57—16 16 Claims

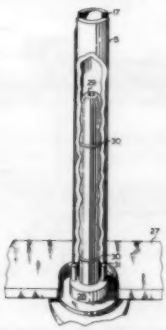
1. An apparatus for producing a covered yarn composed of at least one strand of hard fiber wound around an elastomeric filament comprising:

(a) a feed means for feeding a supply of elastomeric filament to a pirn assembly;

(b) a spindle means;

(c) at least one prin assembly comprising a cylinder the inside and outside diameters of which vary no more than ±0.001 of an inch and a balloon cap comprising a shank portion and a head portion, said shank portion received and axially nested inside of one end of said cylinder, the head portion having a diameter greater than that of the outside diameter of said cylinder, said spindle axially nested inside of said cylinder;

(d) a take-up assembly; and,



(e) a means to rotate said spindle, feed means and take-up assembly.

4,489,542

SPUN LIKE FIBER YARN PRODUCED BY INTERLACING

Michel Buzano, Villeurbanne, and Joanny Danancier, Caluire, both of France, assignors to Rhone-Poulenc Fibres, Lyons, France

Filed Dec. 23, 1982, Ser. No. 452,720
Claims priority, application France, Dec. 28, 1981, 81 24469
Int. Cl.³ D02G *3/34*
U.S. Cl. 57—206 17 Claims

1. A spun like fiber yarn produced from at least one group of fibers, the fibers in each group of fibers being of the same length, said yarn having alternating zones of loosely packed open fibers and closely packed fibers, the fibers in the open zones being arranged in parallel and being non-twisted, the open zones further including free strands, the fibers in the

closely packed zones being interlaced and non-bonded, and the spun fiber yarn having a cohesion factor of more than 100.

4,489,543

SELF-CRIMPING YARN

James E. Bromley, Pensacola, Fla.; John R. Dees, Charlotte, N.C.; Harold M. Familant, Chesterfield, Mo.; Wayne T. Mowe, Pensacola, Fla., and Darwyn E. Walker, Wilbraham, Mass., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 206,128, Nov. 6, 1980, abandoned, which is a continuation of Ser. No. 882,290, Feb. 27, 1978, abandoned, which is a division of Ser. No. 825,495, Aug. 17, 1977, abandoned, and a continuation-in-part of Ser. No. 167,164, Jul. 9, 1980, Pat. No. 4,419,313, which is a continuation-in-part of Ser. No. 55,859, Jul. 9, 1979, abandoned, which is a continuation of Ser. No. 825,495, Aug. 17, 1977, abandoned. This application Dec. 10, 1981, Ser. No. 329,488

Int. Cl.³ D02G *3/24, 1/18;* D01D *5/22*

U.S. Cl. 57—208 **7 Claims**

1. An as-spun self-crimping yarn comprising a plurality of polyester continuous filaments,

(a) said filaments having non-round cross-sectional areas which vary substantially regularly along the lengths of said filaments from regions of large cross-sectional area to regions of small cross-sectional area, said variation in cross-sectional area being more than ±10% about a mean value,

(b) said regions of large and small cross-sectional area being out of phase from filament to filament to thereby form said self-crimping yarn.

4,489,544

METHOD OF PIECING YARNS IN A SPINNING MACHINE UTILIZING AN AIR STREAM

Takayuki Morita, Kariya, and Takahiko Tsunekawa, Aichi, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Aug. 8, 1983, Ser. No. 521,110

Claims priority, application Japan, Aug. 12, 1982, 57-140159

Int. Cl.³ D01H *15/02*

U.S. Cl. 57—261 **12 Claims**

1. A method of piecing yarns in a spinning machine utilizing an air stream and having a twisting mechanism for twisting a sliver supplied therein into a spun yarn and a bobbin for winding the spun yarn therearound, said method comprising the steps of:

detecting the thickness of the yarn unwound from said bobbin and storing the detected thickness in a memory;

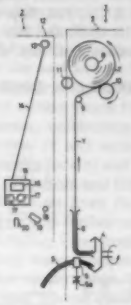
inserting an end of the unwound yarn into said twisting mechanism;

causing a newly supplied sliver to intertwine with the inserted end of the unwound yarn thereby forming a pieced yarn portion;

thereafter, detecting the thickness of the pieced yarn portion;

comparing the detected thickness of the pieced yarn portion with the stored thickness of the unwound yarn;

cutting off the unwound yarn when the thickness of the pieced yarn exceeds an allowable value as a result of the comparing step; and



thereafter, piecing a cut end of the unwound yarn with said sliver.

4,489,545

METHOD AND APPARATUS FOR PRODUCING A FASCIATED YARN

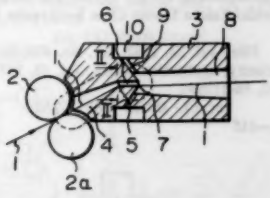
Kawabata Susumu, Aichi; Niimi Hiroshi, Nagoya; Asahara Meiji, Kariya, and Omori Hiroshi, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of Aichi, Japan

Filed May 12, 1983, Ser. No. 494,066

Claims priority, application Japan, May 14, 1982, 57-080120

Int. Cl.³ D02G *1/16*

U.S. Cl. 57—333 **11 Claims**

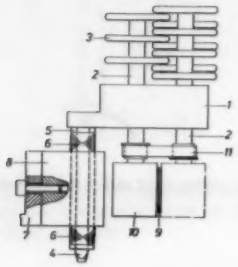


1. An apparatus for producing a fasciated yarn having an air nozzle for imparting a false twist to a fiber bundle to be treated, said nozzle comprising a fiber passage in which an inlet portion, a smaller channel, and a large channel are successively arranged from upstream to downstream along a traveling route of said fiber bundle, said large channel being provided with at least one jet pointing tangentially toward said fiber passage, said apparatus being characterized in that said small channel and said large channel are coaxially arranged and at least a contact area is formed in a zone extending from said inlet portion to an upstream region of said small channel.

4,489,546
FRICTION FALSE-TWISTING UNIT

Friedrich Schuster, Hammelburg, and Hans Weigert, Schweinfurt, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer & Co., Fed. Rep. of Germany

Filed May 18, 1983, Ser. No. 495,813
Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218902
Int. Cl.³ D02G *1/04*; D01H *7/92*
U.S. Cl. 57—340 **13 Claims**



1. A friction false-twisting unit for yarn filament, comprising:

a base plate; a plurality of upstanding shafts supported on and standing up from the base plate; the shafts being oriented parallel to each other; the shafts being rotatable; at least one friction disc carried on each shaft and being rotatable therewith; the shafts being so spaced and the discs being so sized that the discs on all shafts are overlapping at a side thereof, whereby yarn threaded past the overlapping discs contacts all of the overlapping discs;

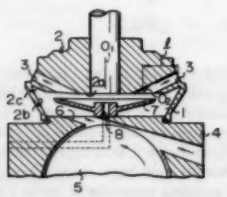
a machine bed to which the false-twisting unit is fastened; and

damping elements interposed between the machine bed and the false twisting unit, wherein the entire false-twisting unit is fastened to the machine bed by the damping elements.

4,489,547
FIBER CONTROL APPARATUS IN OPEN END SPINNING FRAME

Susumu Kawabata, Aichi; Tetsuzo Inoue, Nagoya; Tadanori Kurushima, Kariya, and Kazuo Kamiya, Nishio, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of Aichi, Japan

Filed Jul. 22, 1982, Ser. No. 400,606
Claims priority, application Japan, Jul. 28, 1981, 56-117989; Jul. 28, 1981, 56-117990
Int. Cl.³ D01H *7/885, 7/882*
U.S. Cl. 57—415 **5 Claims**



1. A spinning rotor for an open end spinning frame, said rotor having a central axis of rotation and comprising:

a bottom surface having a substantially flat major central position and an upwardly extending frustoconical peripheral portion;

a frustoconical wall extending downwardly from the periphery of said frustoconical peripheral portion of said bottom surface to form a fiber gathering groove at the junction of said frustroconical wall and frustoconical peripheral surface; and

at least one upwardly and outwardly extending exhaust vent having a central axis and an inlet in the major central portion of said bottom surface below said frustoconical peripheral portion thereof for discharging air from a spinning chamber partially defined by said bottom surface and frustoconical wall, by a centrifugal force produced by rotation of the rotor so that a negative air pressure is created within said spinning chamber and opened fibers are carried into said spinning chamber via a fiber passage by said negative air pressure,

there being an acute angle between (i) a projection of the central axis of said exhaust vent on a plane perpendicular to said axis of rotation and including said inlet, and (ii) a radius extending from said axis of rotation to the center of said inlet, said projection being disposed on a side of said radius extending in the direction of rotation of said rotor or the direction opposite thereto,

said exhaust vent inlet being located radially outward of a point midway between the axis of rotation of said rotor and said fiber gathering groove.

4,489,548
TENSION SPRING DEVICE

Karl G. Derman, Sörgårdsvägen 7, S-433 00 Partille, Sweden

Continuation-in-part of Ser. No. 119,215, Feb. 7, 1980, abandoned. This application Jun. 28, 1982, Ser. No. 392,771
Claims priority, application Sweden, Jul. 2, 1979, 7901056
Int. Cl.³ F16G *13/00*
U.S. Cl. 59—79.1 **11 Claims**

1. A tension spring device comprising: a linear draw element; a spring member means comprising an elastic elongated tube enclosing a given length of said draw element within its hollow center space; enlarged end portions on the ends of said tube having a greater outside diameter than the portion of said tube between the ends; an annular reinforcing ring made of rigid material embedded in each end portion of said tube; and means at each end of said spring member tube fixedly connecting each end to said draw element at each end of said given length, said spring member being in an initially untensioned state; so that when tension is applied to the linear draw element along its linear axis, the initial shock of said tension is absorbed by the spring member, which is capable of stretching until said given length of the draw element is no longer contracted.

4,489,549
GAS GENERATOR WITH RATCHET NO-BACK AND METHOD

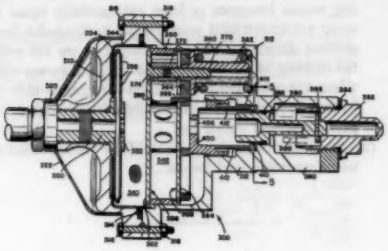
George Kasabian, Los Angeles, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

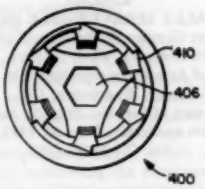
Filed Aug. 17, 1983, Ser. No. 524,047
Int. Cl.³ F02C *3/20*; F01N *3/15*
U.S. Cl. 60—39.02 **22 Claims**

19. A method of generating a controlled emergency flow of motive gas, comprising:

delivering a pulsed, pressurized liquid fluid flow at a variable pulse rate;

reacting said fluid flow with a confined bed of catalyst particles to generate said emergency flow of motive gas, the pulsing of said fluid flow tending to cause vibration in said bed of catalyst particles;





inhibiting said vibration in said bed caused by said pulsing of said fluid flow by confining said bed of catalyst particles with a plate and providing a ratchet adjustment of said plate to prevent movement of said plate away from said bed of catalyst particles, said ratchet adjustment operating in a one-way direction.

4,489,550

SYSTEM FOR CONTROLLING THE THRUST NOZZLE ADJUSTMENT OF DUAL CYCLE GAS TURBINE JET PROPULSION ENGINES

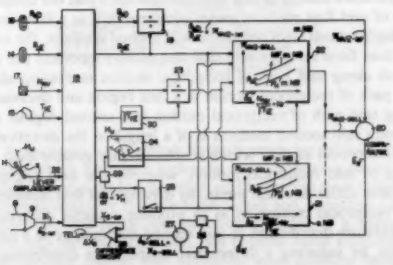
Juergen Peikert, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Division of Ser. No. 171,258, Jul. 22, 1980, abandoned. This application Jan. 14, 1983, Ser. No. 458,063

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1979, 2930956

Int. Cl.³ F02K *1/06*

U.S. Cl. 60—204 **2 Claims**



1. An apparatus for adjusting the thrust nozzle opening angle of a dual cycle gas turbine jet propulsion engine with a first hot flow circuit and a second cool flow circuit, comprising first turbine means, low pressure compressor means operatively connected to said turbine means for driving said low pressure compressor means which includes a radially inwardly located compressor for said first flow circuit and a radially outwardly located compressor for said second flow circuit, second turbine means, high pressure compressor means operatively conneced to said second turbine means for driving said high pressure compressor means, combustion chamber means operatively located upstream of said second turbine means, afterburner means operatively located and connected to receive the hot turbine exhaust gases from said first hot flow circuit, and to receive the compressed air from the second relatively cool flow circuit, said apparatus further comprising power control lever means (H) including lever position sensor means, computer means including memory means operatively connected to said lever position sensor means for sensing the instantaneous position of said power control lever means (H) to thereby indicate the active or inactive state of said afterburner means, pressure sensor means operatively connected to said computer means for incidating a respective flight altitude, said computer means being responsive to said afterburner state and to said altitude for selecting a rated control function in accordance with the instantaneous operating state of said afterburner means and in accordance with the respective flight altitude from the respective computer memory means, speed signal providing means (15, 17, 30, 23) connected to said computer means for responding to an instantaneous reduced rpm value (N_r) of the low pressure compressor (1) to select a respective rated value from the stored, rated and selected control function, comparator means (20) operatively connected to said computer means (19, 21; 22) to receive a measured value $\pi_{NVZ\text{-}Ist}$ and a rated value $\pi_{NVZ\text{-}Soll}$ to produce a control value ($\epsilon\pi$), means (31) for providing an actual nozzle opening angle value, difference circuit means (28) operatively connected to receive the control value ($\epsilon\pi$) and said actual nozzle opening angle value, and nozzle angle control means (11) responsive to said difference means (28) for controlling the nozzle angle so as to reduce the output of said difference circuit means to zero.

4,489,551

FAILURE DETECTION SYSTEM FOR HYDRAULIC PUMP

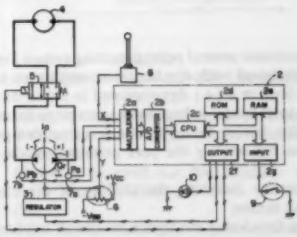
Hiroshi Watanabe, and Eiki Izumi, both of Ibaraki, Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Jan. 18, 1984, Ser. No. 571,732

Claims priority, application Japan, Jan. 19, 1983, 58-5798; Nov. 15, 1983, 58-214775

Int. Cl.³ F15B *21/02*

U.S. Cl. 60—328 **10 Claims**



1. A failure detection system for a hydraulic pump having displacement volume varying means and connected to at least one hydraulic actuator to constitute a hydraulic circuit for driving said hydraulic actuator, such failure detection system comprising:

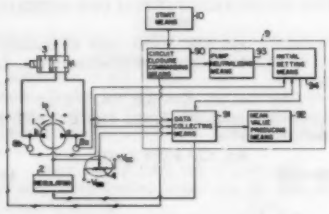
(a) means for sensing the discharge pressure of said hydraulic pump;
(b) means for detecting the value of shifting of said displacement volume varying means;
(c) means for closing said hydraulic circuit to block the flow of a hydraulic fluid through the hydraulic circuit;
(d) starting means for giving a command to start checking on the hydraulic pump to see if it is normally functioning;
(e) control means for performing checking on the hydraulic pump to see if it is normally functioning;
(f) said control means including: (i) means responsive to the command given by said starting means for giving a command to activate said closing means; (ii) data collecting means for causing said displacement volume varying means to shift based on information supplied by said pressure sensing means and shifting detecting means until the discharge pressure of the hydraulic pump becomes at least substantially equal to a predetermined reference pressure to collect data on the value of the shifting of said displacement volume varying means when the discharge pressure becomes substantially equal to the reference pressure; and (iii) failure judging means for comparing the value collected by said data collecting means with a predetermined reference value of shifting to produce a failure signal when the collected value is greater than the reference value; and
(g) indication means responsive to said failure signal produced by said failure judging means for indicating that the hydraulic pump is not normally functioning.

4,489,552

AUTOMATIC NEUTRAL POINT DETECTING SYSTEM FOR HYDRAULIC PUMP

Hiroshi Watanabe, and Eiki Izumi, both of Ibaraki, Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1983, Ser. No. 538,786
Claims priority, application Japan, Oct. 5, 1982, 57/173857; Sep. 20, 1983, 58/173995
Int. Cl.³ F15B *21/02*
U.S. Cl. 60—389 **10 Claims**



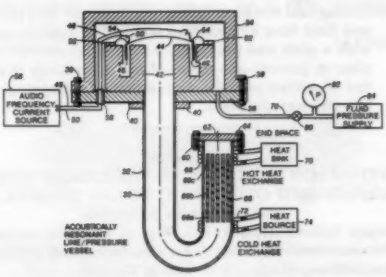
1. An automatic neutral point detecting system for a hydraulic pump equipped with displacement varying means capable of shifting both in a (+) direction and in a (−) direction and connected to at least one hydraulic actuator to form a hydraulic circuit for driving the hydraulic actuator, comprising:
(a) means for sensing the port pressures of the hydraulic pump;
(b) means for detecting the shifting of the displacement varying means;
(c) means for closing the hydraulic circuit to block the flow of a hydraulic fluid therethrough;
(d) start means for giving a command to start detection of the neutral point of the hydraulic pump; and
(e) control means for performing detection of the neutral point of the hydraulic pump;
(f) said control means including:
(i) means responsive to the command given by said start means for giving a command to activate said closing means;
(ii) data collecting means for causing the displacement varying means to shift at least once in the (+) direction and in the (−) direction based on information from said pressure sensing means and said shifting detecting means until the port pressure of the hydraulic pump on the discharge side thereof sensed by said pressure sensing means becomes at least substantially equal to the same predetermined pressure set beforehand for each shifting direction, and collecting data on the values of the shifting of the displacement varying means obtained when the port pressure on the discharge side of the hydraulic pump becomes substantially equal to the predetermined value; and
(iii) means for obtaining a mean of the values collected by said data collecting means.

4,489,553

INTRINSICALLY IRREVERSIBLE HEAT ENGINE

John C. Wheatley; Gregory W. Swift, both of Los Alamos, and Albert Migliori, Santa Fe, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 292,979, Aug. 14, 1981, Pat. No. 4,398,398. This application Nov. 30, 1982, Ser. No. 445,650
Int. Cl.³ F02G *1/00*
U.S. Cl. 60—516 **24 Claims**



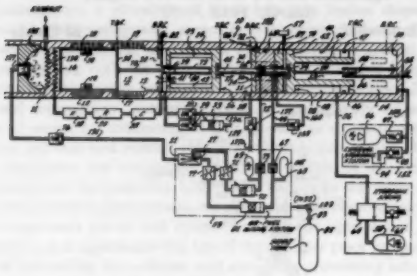
1. A heat engine comprising a first medium and a second medium in imperfect thermal contact with one another, said first medium being movable in reciprocal motion with respect to said second medium along a path of reciprocal motion, said reciprocal motion of said first medium being accompanied by a temperature change in said first medium such that the temperature of said first medium varies progressively as a function of its displacement with respect to said second medium, the average heat flow between said first and second mediums per unit length along said path of reciprocal motion increasing along said path of reciprocal motion in a first region and decreasing along said path of reciprocal motion in a second region, and wherein said second medium is of a length in the direction of said reciprocal motion which is substantially greater than the range of said reciprocal motion, whereby the heat engine is operable either as a heat pump, by driving said first medium in said reciprocal motion so as to produce a useful differential temperature distribution in said second medium, or as a prime mover, by inducing a differential temperature distribution in said second medium to thereby cause said first medium to move in cyclical reciprocal motion that may be applied to perform useful mechanical work.

4,489,554

VARIABLE CYCLE STIRLING ENGINE AND GAS LEAKAGE CONTROL SYSTEM THEREFOR

John Otters, 11317 Miller Rd., Whittier, Calif. 90604

Filed Jul. 9, 1982, Ser. No. 396,606
Int. Cl.³ F02G 1/04, 1/06
U.S. Cl. 60—518 45 Claims



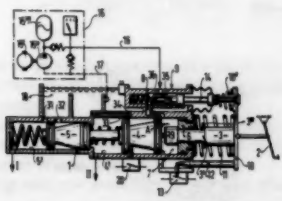
1. A thermal engine comprising:
an engine housing;
a chamber defined within said housing;
a displacer piston within said chamber;
first means for reciprocating said displacer piston;
a working fluid within said chamber susceptible to a thermodynamic cycle responsively to movement of said displacer piston;
a work piston reciprocably driven by said working fluid;
second means for controlling the movement of said work piston relative to said displacer piston independently from said means for reciprocating said displacer piston; and
engine controller means connected to said first and second means for controlling the phase relationship between said displacer piston and said work piston to thereby produce a desired engine cycle.

4,489,555

HYDRAULIC DUAL-CIRCUIT BRAKE BOOSTER

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 3, 1983, Ser. No. 538,639
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1982, 3244560
Int. Cl.³ F15B 7/00
U.S. Cl. 60—534 20 Claims



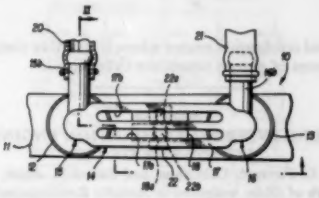
1. A hydraulic dual-circuit brake booster for vehicle brake systems, which includes a hydraulic main cylinder actuated via a pedal-moved push rod in which said hydraulic main cylinder is disposed coaxially relative to said push rod, a control valve switched by the pedal for directing pressure of a pressure source into the main cylinder, said control valve including a travel limiting means, said hydraulic main cylinder being a dual-circuit tandem main cylinder operable to control two closed brake circuits, said pedal push rod being supported in and movable relative to a displaceable piston including an inner effective surface which is subjected to pressure directed into the system by the control valve and said pedal push rod and the tandem main cylinder are coaxially disposed with said pedal push rod extending from one end of said tandem main cylinder.

4,489,556

TANDEM BRAKE MASTER CYLINDER

Junichi Komorizono, and Akihiko Miwa, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 31, 1983, Ser. No. 480,867
Claims priority, application Japan, Apr. 6, 1982, 57-049839[U]
Int. Cl.³ F15B 7/00
U.S. Cl. 60—585 9 Claims



1. A tandem brake master cylinder having a reservoir and comprising:
a cylinder body having a first and second boss;
inlet means operatively associated with said body and made of resinous material and which further comprises a first and second inlet portion, a connecting portion interconnecting said first and second inlet portions as single unitary body, and a mounting portion which projects from an approximately central portion of said inlet means toward said cylinder body, said mounting portion having at least one hole formed therein in a transverse direction of said cylinder body, wherein each of said first and second inlet portions further comprises a sealing member mounted on said body, a first tubular portion which is positioned within said sealing member and within an inner wall portion of one of said first and second bosses and a second tubular portion;
a hose connected to said second tubular portion and in communication with said reservoir; and
means disposed in said at least one hole in said mounting portion for mounting said inlet means to said body.

4,489,557

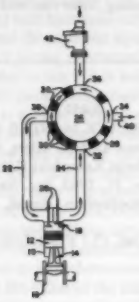
TURBOCHARGER FOR INTERNAL COMBUSTION ENGINES

Sherwood L. Fawcett, Columbus, and James N. Anno, Cincinnati, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Feb. 22, 1980, Ser. No. 123,543
Int. Cl.³ F02B 37/00
U.S. Cl. 60—605 7 Claims

1. Turbocharger apparatus for an internal combustion engine comprising a continuous, closed- loop passageway, a plurality of freely-movable bodies disposed within said passageway, means to introduce exhaust gases from said internal combustion engine into one region of the passageway for propelling said bodies in one direction around the passageway, means to introduce a gas into another region of the passageway for converting at least a portion of the kinetic energy of the pro-

pelled bodies into energy in the form of a compressed gas, and means for conducting said compressed gas to the cylinders of



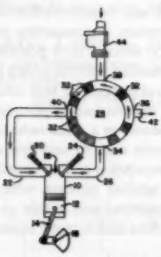
said internal combustion engine where it is further compressed by movement of pistons within the cylinders.

4,489,558

COMPOUND INTERNAL COMBUSTION ENGINE AND METHOD FOR ITS USE

Sherwood L. Fawcett, Columbus, and James N. Anno, Cincinnati, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Feb. 22, 1980, Ser. No. 123,544
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—605 **21 Claims**



1. A method for operating an internal combustion engine having at least one piston reciprocable within a cylinder, which comprises the steps of compressing an oxygen-containing gas which is to be injected into the cylinder with the use of energy derived from exhaust gases issuing from the engine, and injecting said compressed gas into said cylinder as said piston approaches the top of the cylinder just prior to ignition of fuel mixed with the gas.

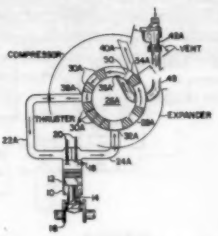
16. In an internal combustion engine, a cylinder, a piston reciprocable within said cylinder, a continuous, closed-loop passageway, a plurality of freely-movable bodies disposed within said passageway, means in one region of the passageway for propelling said bodies in one direction around the passageway with the use of exhaust gases from said internal combustion engine, means in another region of the passageway for converting at least a portion of the kinetic energy of the propelled bodies into energy in the form of a compressed gas, means for conducting said compressed gas to said cylinder during the upstroke of said piston as it approaches the top of the cylinder prior to ignition of fuel within the cylinder, and means for preventing substantial compression of gas within said cylinder during the upstroke of said piston and prior to conduction of said compressed gas to the cylinder.

4,489,559

TURBOCHARGER FOR INTERNAL COMBUSTION ENGINES

Sherwood L. Fawcett, Columbus, and James N. Anno, Cincinnati, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 123,543, Feb. 22, 1980,. This application Jul. 23, 1982, Ser. No. 401,264
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—605 **12 Claims**



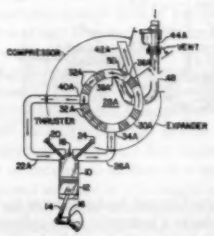
1. Turbocharger apparatus for an internal combustion engine comprising a continuous, closed-loop passageway, a plurality of freely-movable bodies disposed within said passageway, means to introduce exhaust gases from said internal combustion engine into one region of the passageway for propelling said bodies in one direction around the passageway, means for exhausting exhaust gases from said passageway, means substantially immediately adjacent said means for exhausting for introducing an oxygen-containing gas into said passageway, means in another region of the passageway for converting at least a portion of the kinetic energy of the propelled bodies into energy in the form of a compressed gas, and means for conducting said compressed gas to the cylinders of said internal combustion engine where it is further compressed by movement of pistons within the cylinders.

4,489,560

COMPOUND INTERNAL COMBUSTION ENGINE AND METHOD FOR ITS USE

Sherwood L. Fawcett, Columbus, and James N. Anno, Cincinnati, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 123,544, Feb. 22, 1980,. This application Jul. 23, 1982, Ser. No. 401,265
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—605 **23 Claims**



1. A method for operating an internal combustion engine having at least one piston reciprocable within a cylinder, which comprises the steps of introducing an oxygen-containing gas into an expansion space defined by means outside said cylinder substantially immediately after expanding exhaust gases issuing from the engine in said expansion space, com-

pressing the oxygen-containing gas which is to be injected into the cylinder in said expansion space with the use of energy derived from expanded exhaust gases, and injecting said compressed gas into said cylinder as said piston approaches the top of the cylinder just prior to ignition of fuel mixed with the gas.

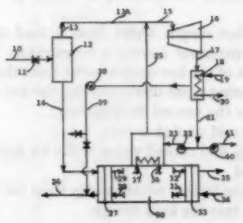
18. In an internal combustion engine, a cylinder, a piston reciprocable within said cylinder, a continuous, closed-loop passageway, a plurality of freely-movable bodies disposed within said passageway, means in one region of the passageway for propelling said bodies in one direction around the passageway with the use of exhaust gases from said internal combustion engine, means for exhausting exhaust gases from said passageway, means substantially immediately adjacent said means for exhausting for introducing an oxygen-containing gas into said passageway, means in another region of the passageway for converting at least a portion of the kinetic energy of the propelled bodies into energy in the form of a compressed oxygen-containing gas, means for conducting said compressed gas to said cylinder during the upstroke of said piston as it approaches the top of the cylinder prior to ignition of fuel within the cylinder, and means for preventing substantial compression of gas within said cylinder during the upstroke of said piston and prior to conduction of said compressed gas to the cylinder.

4,489,561

SYSTEM FOR PRODUCING STEAM AND MECHANICAL ENERGY FROM A HYDROTHERMAL FLOW

Jerome S. Spevack, 160 W. Pinebrook Dr., New Rochelle, N.Y. 10804

Filed Sep. 30, 1982, Ser. No. 428,651
Int. Cl.³ F03G 7/04
U.S. Cl. 60—641.5 **20 Claims**



1. A process for producing power with a steam driven prime mover from a two-phase steam and liquid water hydrothermal flow, which comprises:

(a) separating said two-phase flow into a raw steam flow and a hot water flow at a pressure at least that of the desired inlet pressure of said prime mover;

(b) delivering said raw steam flow to the inlet of said prime mover;

(c) passing said hot water flow through heat conversion means for extracting sensible heat from said hot water flow and producing a flow of auxiliary steam at least at said inlet pressure from a portion of said extracted heat and a supply of boiler water;

(d) delivering said flow of auxiliary steam produced in step (c) to said prime mover inlet; and

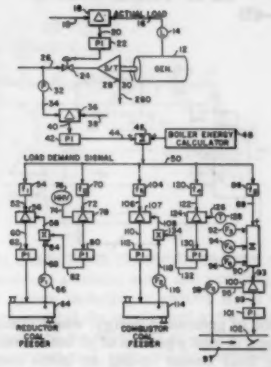
(e) producing mechanical power by expanding in said prime mover said flow of raw steam delivered in step (b) and said flow of auxiliary steam delivered in step (d), and condensing expanded steam discharged from said primer mover.

4,489,562

METHOD AND APPARATUS FOR CONTROLLING A GASIFIER

Troxell K. Snyder, South Windsor, and Paul H. Chase, East Granby, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 8, 1982, Ser. No. 439,969
Int. Cl.³ F22D 5/28; G05B 1/00
U.S. Cl. 60—667 **10 Claims**



1. A method for controlling the feed rate of fuel and the feed rate of oxidant into a gasifier for producing a product fuel gas, wherein a portion of the energy output of said gasifier is employed to generate steam for driving a steam turbine for the production of electric power, comprising the steps of:

throttling said steam turbine to achieve a desired electrical output level;

determining a desired product gas heating value as a function of a load demand signal;

measuring the actual product gas heating value;

measuring the pressure of the unthrottled steam;

comparing the measured steam pressure with a predetermined pressure setpoint;

generating the load demand signal responsive to any difference between the measured steam pressure and the predetermined setpoint;

comparing the desired and actual product gas heating values;

adjusting the fuel feed rate into said gasifier to compensate for any difference between the measured and the actual product gas heating values;

adjusting the oxidant feed rate into said gasifier in response to the load demand signal.

3. An apparatus for controlling the feed rate of fuel and the feed rate of oxidant into a gasifier for producing a product fuel gas, wherein a portion of the energy output of said gasifier is employed to generate steam for driving a steam turbine for producing electric power, comprising:

a throttle for regulating said steam turbine for producing a desired amount of electric power;

means for generating a signal commensurate with the desired product gas heating value in response to a load demand signal;

means for generating a signal commensurate with the actual product gas heating value;

means responsive to the desired and actual heating value signals for generating a heating value error signal;

means responsive to the heating value error signal for adjusting the fuel feed rate;

means for generating a signal commensurate with the pressure of said steam at a location upstream of said throttle;

means responsive to the pressure signal and a desired pressure setpoint for generating a pressure error signal;

means responsive to the pressure error signal for generating the load demand signal; and

means responsive to the load demand signal for adjusting said oxidant feed rate.

4,489,563

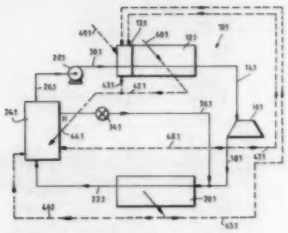
GENERATION OF ENERGY

Alexander I. Kalina, 12214 Clear Fork, Houston, Tex. 77077

Filed Aug. 6, 1982, Ser. No. 405,942

Int. Cl.³ F01K *25/06, 25/10*

U.S. Cl. 60—673 **37 Claims**



1. A method of generating energy, which comprises:

(a) subjecting at least a portion of an initial multicomponent working fluid stream having an initial composition of lower and higher boiling components, to patial distillation at an intermediate pressure in a distillation system to distil or evaporate only part of the stream subjected to said distillation and thus generate an enriched vapor fraction which is enriched with a lower boiling component relatively to a main rich solution;

(b) mixing the enriched vapor fraction with part of the initial working fluid stream and absorbing it therein to produce at least one such main rich solution which is enriched relatively to the initial working fluid stream with respect to a lower temperature boiling component, and using a remaining part of the initial working fluid stream as at least one lean solution which is impoverished relatively to the main rich solution with respect to a lower temperature boiling component;

(c) increasing the pressure of the main rich solution to a charged high pressure level and evaporating the main rich solution to produce a charged gaseous main working fluid;

(d) expanding the charged gaseous main working fluid to a spent low pressure level to transform its energy into usable form; and

(e) cooling and condensing the spent main working fluid in a main absorption stage by dissolving it in the lean solution at a pressure lower than the intermediate pressure to regenerate the initial working fluid.

4,489,564

HYDRIDE STORAGE FOR HYDROGEN

Peter Häusler, Hattingen, and Norbert Nathrath, Bottrop, both of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,264

Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3216917

Int. Cl.³ F17C *11/00*

U.S. Cl. 62—48 **18 Claims**

1. A hydride storage for hydrogen comprising a rigid tubular housing containing a storage material therein having one closed end and an opposite end with an external connection, means defining a bore in said external connection and into said housing for the flow of hydrogen, a filter in said bore, a flexible fabric material in the form of a tube extending axially in said housing and defining a space communicating with said bore, said fabric material being resistant to hydrogen and bounding one axially extending surface of said storage material so that hydrogen can pass into and out of said storage material and so

that said storage material can expand and contract radially into and out of said space.

4,489,565

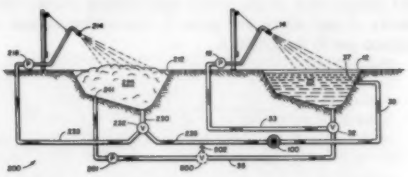
PROCESS COOLING METHOD AND APPARATUS UTILIZING AEROSOL SPRAYS

Theodore B. Taylor, Damascus, Md., assignor to Nova, Inc., Gaithersburg, Md.

Filed Jun. 16, 1983, Ser. No. 505,092

Int. Cl.³ F25C *5/18*

U.S. Cl. 62—59 **7 Claims**



1. A method of supplying a cooling capacity through a combination of spray cooling and spray freezing, comprising:

(a) spraying water into a first environment having a temperature below the freezing point of the water such that the sprayed water is at least partially frozen as a result of its contact with the first environment;

(b) collecting the at least partially frozen sprayed water to an ice pond;

(c) spraying hot output water from a load device into a second environment having a temperature between the temperature of the hot output water from the load device and the freezing point thereof so that the hot output water is cooled by the second environment;

(d) collecting said cooled water;

(e) transferring said cooled water to the ice pond for further cooling; and

(f) removing the further cooled water from the ice pond and inputting it into the load device.

4,489,566

CRUSHED ICE MAKING METHOD AND APPARATUS

Robert Saltzman, 7420 SW. 163rd St., Miami, Fla. 33157

Filed Apr. 25, 1983, Ser. No. 488,144

Int. Cl.³ F25C *5/10*

U.S. Cl. 62—73 **16 Claims**

1. Means for forming crushed ice, comprising:

means confining water in a column;

means introducing water into the upper end of said column;

refrigeration means having a refrigeration flow path in heat exchange relationship with the water in said column;

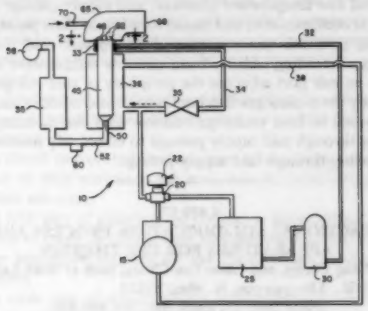
air supply means providing air to the bottom of said means confining water;

pressure sensing means sensing the pressure of the air supplied;

valve means controlled by said air pressure sensing means to direct either hot or cold refrigerant to the refrigeration flow path, whereby upon freezing of the water in said confining means, air flow will be restricted, causing a

pressure build-up against the formed ice to discharge same from the confining means; and

heating means arranged in heat exchange relationship with



the upper end of said means confining water in a column while the lower portion of said water confining means is in heat exchange relationship with expanding heat absorbing refrigerant.

4,489,567

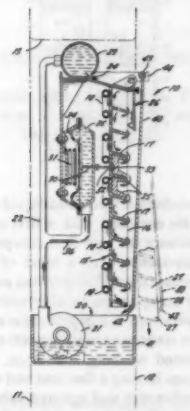
STACKABLE WATER PRESSURE EJECTION CONTROL ICE CUBE MAKER

Vance L. Kohl, Manitowoc, Wis., assignor to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Sep. 16, 1983, Ser. No. 532,773

Int. Cl.³ F25C *1/12, 5/16*

U.S. Cl. 62—138 **4 Claims**



1. An ice making machine comprising, in combination, a substantially vertical mold having an open outer face divided into cube cells and being intimately associated with refrigeration evaporator coils, an open top drain trough underlying said mold, means for pressurizing water in said trough and lifting the water to the top of said mold so that water will flow over said open face and into said cells, a plunger mounted for movement into said mold for pushing formed ice out of said open face, means for biasing said plunger in said ice pushing direction, and means for applying said pressurized water to overcome said bias and hold said plunger out of said mold, whereby deactivating said water pressurizing means will cause the plunger to urge ice from the mold.

4,489,568

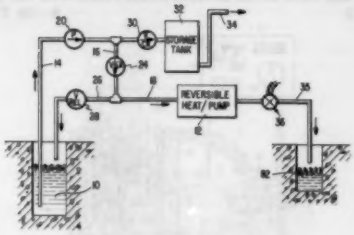
GROUND WATER HEAT PUMP SYSTEM

Robert P. Shapess, Cato, N.Y., assignor to Snyder General Corporation, Dallas, Tex.

Continuation of Ser. No. 345,294, Feb. 3, 1982,. This application Apr. 13, 1984, Ser. No. 599,601

Int. Cl.³ F25B *13/00*

U.S. Cl. 62—324.1 **7 Claims**



1. A water supply system for an electrically operated reversible heat pump operable in a heating mode and a cooling mode, said water supply system including a ground water supply well, a supply line connecting the supply well to the heat pump and to a water storage tank for supplying ground water to said heat pump and said storage tank, respectively, a discharge line connected to said heat pump for conducting water which has passed through said heat pump to a discharge point away from said supply well, an electrically controlled water regulating valve for controlling the flow of water through said heat pump to said discharge line so as to provide a restricted flow of water in a first operating mode of said heat pump, a relatively unrestricted flow of water through said heat pump in a second operating mode of said heat pump, and to shutoff the flow of water through said heat pump, electrically operated water pump means interposed in said supply line for conducting water under pressure to said heat pump and said storage tank, an escape line connected to said supply line between said heat pump and said water pump means for conducting water from said supply line back to said supply well, pressure relief valve means for controlling the flow of water through said escape line in accordance with the amount of restriction of water flow through said heat pump by said water regulating valve to maintain pressure in said storage tank and to return water to said supply well, and a control circuit including first switch means for energizing said heat pump in said first and second operating modes, respectively, second switch means for controlling said water regulating valve in accordance with the operating mode of said heat pump, third switch means for energizing and deenergizing said water pump means, said first, second and third switch means being operably interconnected to control said water regulating valve and said water pump means in accordance with the operating mode of said heat pump, and fourth switch means for energizing said water pump means independent of the operating mode of said heat pump to maintain a predetermined water pressure in said storage tank.

4,489,569

COOLING APPARATUS FOR THE RAPID COOLING OF SPECIMENS

Helmuth Sitte, Seefeld, Austria, assignor to C. Reichert Optische Werke AG., Vienna, Austria

Filed Sep. 16, 1983, Ser. No. 532,943

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234457

Int. Cl.³ F25B *19/00*

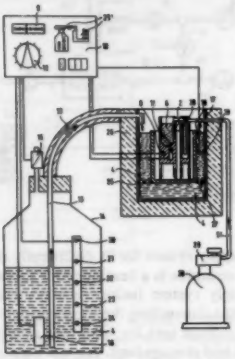
U.S. Cl. 62—514 R **12 Claims**

1. Liquid cooling apparature having an intermediate vessel capable of transferring heat at two different rates which comprises,

a first vessel having an upper rim and being adapted to receive a liquid cryogen,

a second vessel having an upper rim supported in said first vessel, the upper rim of said second vessel being located below the upper rim of said first vessel, said second vessel further being adapted to receive liquid cryogen from said first vessel, when the liquid cryogen level is higher than the upper rim of said second vessel, and

a third vessel having an upper rim, support means positioning said third vessel in said second vessel with the upper



rim of said third vessel being located between the upper rims of said first and second vessels, said third vessel being adapted to receive the liquid to be cooled,

whereby the liquid is cooled by rapid heat transfer from the liquid to the liquid cryogen in said second vessel, when said liquid cryogen level in said first vessel is above the upper rim of said second vessel, and maintained at a chosen temperature by slower heat transfer, when said liquid cryogen level in said first vessel is below the upper rim of said second vessel.

4,489,570

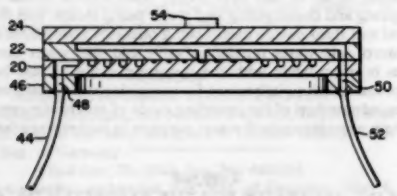
FAST COOLDOWN MINIATURE REFRIGERATORS

William A. Little, Palo Alto, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 445,852, Dec. 1, 1982, abandoned. This application Dec. 16, 1983, Ser. No. 562,214

Int. Cl.³ F25B *19/00*

U.S. Cl. 62—514 R **7 Claims**



1. A microminiature cryogenic refrigerator for cooling superconductor devices and the like comprising at least three plates of material of low like material of low thermal conductivity bonded together in pressure tight contact over an interface area to provide a stiff laminate, said plates having a central region and a peripheral region, an outermost one of said plates being adapted to carry a device to be cooled adjacent its central region, means forming a low temperature chamber at said central region of said laminate, means forming a micron sized supply fluid passage in the interface area between two of said plates connecting an input fluid port to said low temperature chamber, said supply passage comprising a first section for conducting incoming highly compressed gas and a serially connected smaller diameter second capillary section opening into said low temperature chamber, said supply passage being of spiral configuration, and means forming outflow passages in another interface between two of said plates, said outflow passages extending radially from said low temperature chamber to an exit port adjacent the periphery of said refrigerator whereby the cooled gas flowing through said outflow passages is disposed in heat exchange relation with the incoming gas passing through said supply passage to effectively precool the gas passing through said supply passage.

4,489,571

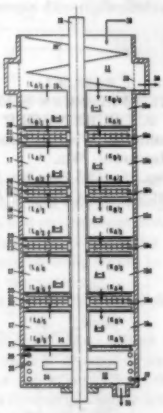
FRACTIONAL SOLIDIFICATION PROCESS AND APPARATUSES FOR USE THEREIN

Sing-Wang Cheng, and Chen-Yen Cheng, both of 9605 LaPlaya St., NE., Albuquerque, N. Mex. 87111

Filed Dec. 27, 1983, Ser. No. 565,856

Int. Cl.³ B01D *9/02*

U.S. Cl. 62—542 **30 Claims**



1. A process of washing a feed solid-liquid mixture containing a mass of crystals enriched with a first component and a liquid mixture containing the said first component and one or more impurity components with a mass of wash liquid, to thereby produce a mass of purified crystals and a residue containing the impurity components by alternative stationary and agitated washing operations in a purification zone containing a set of more than two stationary washing sub-zones and a set of more than one agitated washing sub-zones, said purification zone and the sub-zones having a first end and a second end and the said stationary sub-zones and agitated sub-zones being laid alternatively in the purification zone along the direction from the first end to the second end so that the first end and the second end of an agitated washing sub-zone is respectively connected to the second end of the preceeding stationary sub-zone and the first end of the succeeding stationary sub-zone, wherein the feed solid-liquid mixture is introduced at the first end of the purification zone and the wash liquid is introduced at the second end of the purification zone so that a mass of crystals and a mass of liquid exist in each sub-zone, the mass of crystals in each stationary sub-zone forming a compact bed of crystals that is permeable to the liquid in the sub-zone and the mass of crystals and the mass of liquid in each agitated sub-zone forming an agitated mass of solid-liquid mixture, and comprises the following steps:

(a) a first step of moving the compact mass of crystals in

each stationary sub-zone in the direction from the first end toward the second end;

(b) a second step of moving the liquid through the compact mass of crystals in each stationary sub-zone in the direction from the second end toward the first end to thereby displace liquid from the bed and establish a concentration profile in the liquid mass in the sub-zone, impurity concentration decreasing from the first end toward the second end;

(c) a third step of transferring a solid-liquid mixture from the second end of each stationary sub-zone into the following agitated sub-zone;

(d) a fourth step of transferring a mass of liquid from the first end of each stationary sub-zone into the preceeding agitated sub-zone;

(e) a fifth step of agitating the content in each agitated subzone to break up crystal agglomerates and thereby release the impurities retained by the crystal mass to the free liquid;

(f) a sixth step of transferring a solid-liquid mixture from each agitated sub-zone to the following stationary subzone;

(g) a seventh step of transferring a mass of liquid from each agitated sub-zone to the preceeding stationary sub-zone;

(h) an eighth step of discharging a solid-liquid mixture from the second end of the purification zone, at least a part of the mixture becoming the mass of purified crystals;

(i) a ninth step of discharging a mass of liquid from the purification zone, at least a major part of the discharged liquid becoming the residue of the impurity components,

wherein the process is further characterized by that the beds of compact masses of crystals in at least most of the stationary sub-zones are compacted to degrees substantially higher than the natural degrees of compaction in the sub-zones.

4,489,572

DOUBLE POST EARRING STRUCTURE FOR PIERCED EARS

Barbara J. Wilczewski, 1448 E. Second St., Tucson, Ariz. 85716

Filed Mar. 12, 1982, Ser. No. 342,966

Int. Cl.³ A44C *7/00*

U.S. Cl. 63—13 **1 Claim**

1. An improved earring construction for people having a plurality of spaced apart pierced holes in at least one of their earlobes, wherein the earring construction comprises:

a plurality of post members;

a plurality of rigid, interlocked and relatively moveable ornamental members directly connected to one another and to said post members; and

a plurality of securing mechanisms adapted to secure the said plurality of rigid interlocked ornamental members to said plurality of post members, in the said plurality of spaced apart pierced holes in said one earlobe; wherein the relative movement, permissible between said rigid interlocked ornamental members, allows the earring construction to be employed where the spacing between the pierced holes varies from person to person.

4,489,573

CIRCULAR KNITTING MACHINE

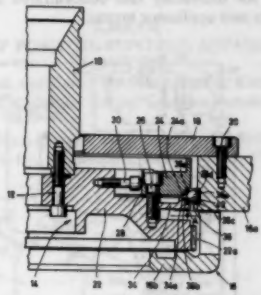
Werner Engelfried, Sindelfingen, and Gerhard Müller, Esslingen, both of Fed. Rep. of Germany, assignors to Terrot Strickmaschinen GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 052,838, Jun. 28, 1979, abandoned. This application Jun. 26, 1981, Ser. No. 277,956

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1978, 2824678

Int. Cl.³ D04B *9/00, 35/00*

U.S. Cl. 66—8 **4 Claims**



1. A circular knitting machine comprising a needle cylinder, a rotatable element in the form of a carrier disc supporting the needle cylinder, a stationary element in the form of a bearing body surrounding the carrier disc, the carrier disc and needle cylinder being rotatable relative to the bearing body around the needle cylinder axis, and bearing balls disposed between the carrier disc and the bearing body, the carrier disc serving as a first bearing support element and carrying bearing means comprising at least two annular bearing surfaces spaced substantially axially relative to the needle cylinder axis, the bearing body serving as a second bearing support element and similarly carrying bearing means comprising at least two annular bearing surfaces spaced substantially axially relative to the needle cylinder axis, the two annular bearing surfaces of the carrier disc bearing means and the two annular bearing surfaces of the bearing body bearing means simultaneously engaging the bearing balls and defining an annular path therefor to form a combination radial and axial bearing providing the sole bearing support for the needle cylinder, one of the annular bearing surfaces of at least one of said bearing means being elastically supported on its associated element by a means which flexes to vary thereby the position of the one said annular bearing surface substantially axially relative to the needle cylinder axis in response to pressure variations between the said one bearing surface and the bearing balls and the other annular bearing surface of the same bearing means being fixed relative to its associated element.

4,489,574

APPARATUS FOR HIGHLY EFFICIENT LAUNDERING OF TEXTILES

Wolfgang U. Spendel, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 320,155, Nov. 10, 1981, abandoned. This application Oct. 28, 1982, Ser. No. 436,169

Int. Cl.³ D06F *23/02, 25/00, 39/08*

U.S. Cl. 68—16 **26 Claims**

1. Laundering apparatus exhibiting increased detergent efficiency in removing soils from discrete loads of assorted soiled textiles, said apparatus comprising:

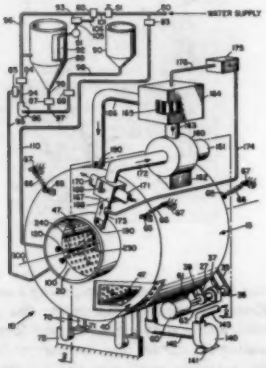
a. a first compartment for retaining said soiled textiles during the laundering process;

b. means for producing a quantity of concentrated aqueous

wash liquor comprising from about 40% to about 99.9% water and at least about 1000 parts per million of a detergent composition;

c. non-immersing applicator means for distributing a quantity of said concentrated aqueous wash liquor not exceeding about 1½ times the dry weight of said soiled textiles onto the surface of said soiled textiles while said textiles are retained in said first compartment and while said soiled textiles are in a substantially dry state, there being at most minimal amounts of free wash liquor in said first compartment after said wash liquor has been completely distributed;

d. means for delivering said concentrated aqueous wash liquor to said applicator means;



e. means for exposing the surfaces of substantially all of said soiled textiles to said applicator means while said concentrated aqueous liquid wash liquor is being distributed in said first compartment, whereby said wash liquor is substantially evenly and completely distributed onto the surfaces of said soiled textiles;

f. rinsing means for contacting said textiles with a quantity of an aqueous liquid rinse liquor after said wash liquor has been allowed to remain in contact with said soiled textiles for a period of time, said quantity of rinse liquor being sufficient to produce enough free water on the surface of the textiles to adequately suspend the soil and detergent composition; and

g. means for separating said rinse liquor containing said wash liquor and said soils from said textiles.

4,489,575

JET DYEING APPARATUS

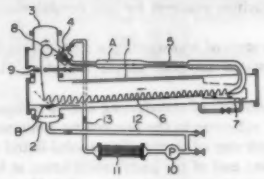
Masahiro Arashi, Komatsu, Japan, assignor to Komatsu Seiren Co., Ltd. and Onomori Iron Works Co., Ltd., both of Ishikawa, Japan

Continuation-in-part of Ser. No. 346,007, Feb. 5, 1982, abandoned. This application Jan. 26, 1984, Ser. No. 573,949
Claims priority, application Japan, Jul. 1, 1981, 56-101252
Int. Cl.³ D06B *3/28*
U.S. Cl. 68—177 **8 Claims**

1. A jet dyeing apparatus, comprising:

a high-pressure cylindrical dyeing vessel having an inlet end and an outlet end, wherein said cylindrical dyeing vessel is oriented generally horizontal with a slight downward inclination in the direction of said outlet end;

a perforated pipe within said cylindrical dyeing vessel extending away from said cylindrical vessel inlet end toward said cylindrical vessel outlet end with a slight downward inclination in the direction of said cylindrical vessel outlet end at least equal to the downward inclination of said cylindrical dyeing vessel, said perforated pipe defining a path for dye liquor and axial travel of a fabric to be dyed therein, said perforated pipe having an inlet end adjacent said cylindricl vessel inlet end with said perforated pipe inlet end having drain perforations dimensioned with diameters in the range of 3 to 5 millimeters and disposed spaced 6 to 15 millimeters and an outlet end adjacent said cylindrical vessel outlet end with said perforated pipe outlet end having drain perforations dimensioned with diameters in the range of 4 to 5 millimeters and disposed spaced 8 to 10 millimeters and being free of perforations at a middle portion of the perforated pipe defined between the inlet and outlet ends of said perforated pipe so as to be effective to drain off at said perforated pipe inlet end into said dyeing vessel excessive dye liquor from the fabric traveling therethrough while retaining sufficient dye liquor in said perforated pipe effective to lubricate the fabric traveling axially through said perforated pipe and



so as to be effective to drain off at said perforated pipe outlet end into said dyeing vessel some of the retained dye liquor from the fabric traveling through the perforated pipe;

a dye liquor reservoir at said cylindrical vessel outlet end and positioned lower than said perforated pipe outlet end for receiving and retaining dye liquor flowing down said cylindrical dyeing vessel from said perforated pipe;

a dye liquor injector for supplying dye liquor to the fabric to be dyed;

a transfer conduit in communication with said perforated pipe for defining a path for fabric being dyed to travel from said dye liquor injector to said inlet end of said cylindrical dyeing vessel and into said perforated pipe; and

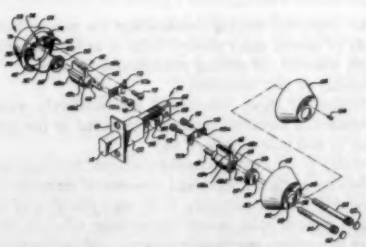
dye liquor circulating means for circulating dye liquor from said dye liquor reservoir to said dye liquor injector.

4,489,576

DEADBOLT ASSEMBLY

Richard O. Mullich, Burbank, and Ray Dushane, Fullerton, both of Calif., assignors to TRE Corporation, Los Angeles, Calif.

Division of Ser. No. 414,293, Sep. 2, 1982, Pat. No. 4,446,707, which is a continuation of Ser. No. 190,354, Sep. 24, 1980, abandoned. This application Mar. 14, 1984, Ser. No. 589,349
Int. Cl.³ E05B *65/06*
U.S. Cl. 70—134 **4 Claims**



1. A lock assembly comprising:

an exterior housing havng a circular opening on the front

surface thereof, a substantially cylindrical bore concentric with the opening and having a diameter slightly greater than the opening so as to form a shoulder therebetween, a substantially rectangular bore extending radially from the cylindrical bore and a longitudinal groove formed in the cylindrical bore slightly offset from the rectangular bore, said housing including a first mounting surface adjacent one side of the rectangular bore and a second mounting surface adjacent the other side of the rectangular bore;

a hardened cylinder cap having a stepped peripheral surface, said cap being located within the cylindrical bore and extending through the opening, whereby the stepped surface abuts the shoulder;

a lock cylinder assembly including a cylindrical body disposed within the cylindrical bore, a first radial extension which is disposed within the rectangular bore and carries a plurality of cylinder pins and an alignment extension having a first surface which abuts the portion of the longitudinal groove and a second surface which is substantially adjacent to and extends inward beyond the first mounting surface of the housing; and

a restraining strap secured to the first and second mounting surfaces, said restraining strap including a middle portion which contacts the rear surface of the first extension of the lock cylinder assembly and biases the lock cylinder assembly tightly against the inside surface of the cylinder cap, a downwardly extending flange adjacent to the end of the strap secured to the second mounting surface and having a curved lower surface which abuts the curved surface of the cylindrical body to bias the alignment extension into the groove, the lower surface of the end of the strap secured to the first mounting surface abutting the second surface of the second extension and forcing the first surface of the second extension against the groove, whereby the lock cylinder assembly is accurately and securely positioned both longitudinally and axially within the housing.

4,489,577

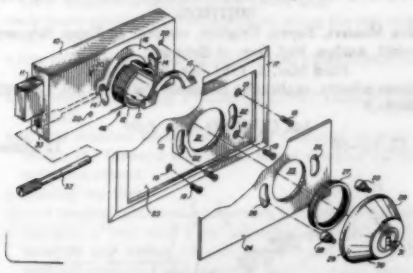
COUPLING OF KEYWAY ROSETTE TO LOCK BODY

Alois Crepinsek, 97 N. Arizona Pl., Chandler, Ariz. 85224

Filed Dec. 10, 1982, Ser. No. 448,686

Int. Cl.³ E05B *15/02, 9/08*

U.S. Cl. 70—452 **5 Claims**



1. In a lock body having a raised element means for providing secure access to the keyway and lock mechanism within the lock body, said raised element means being coupled to said lock body by latch pins affixed to said raised element means and inserted into slide latching recess means coupled to said lock body said latch pins being lockingly engaged within said slide latching recess means upon preselected movement of said raised element means, the improvement for preventing the disengagement of said latch pins from said slide latching recess means comprising:

means for inhibiting disengagement of a first one of said latch pins from a first one of said slide latching recess means said disengagement inhibiting means further comprising means for inhibiting translation of said first one of said latch pins within said first one of said slide latching recess means; and

means, coupling a second one of said latch pins to said first one of said latch pins for inhibiting rotation of said second one about said first one of said latch pins for inhibiting disengagement of said second one of said latch pins from a second one of said slide latching recess means wherein said means coupling a second one of said latch pins to said first one of said latch pins comprises an annular segment further slidingly coupled to said lock body.

4,489,578

SLIDE STOP POSITION CONTROL APPARATUS OF A PRESS

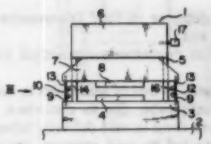
Shunichi Nagai, and Kazuo Hiramura, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,815

Claims priority, application Japan, Dec. 27, 1982, 57-195522[U]

Int. Cl.³ B21B *37/08*

U.S. Cl. 72—21 **3 Claims**



1. In a press machine including a die base, a die mounted on said die base, a slide movable towards and away from said die, and a punch rigidly mounted to said slide, a slide stop position control apparatus, comprising:

means mounted to said die base for detecting the tip of said punch when said slide is moved towards said die;

means mounted to said slide for detecting an upper end of said die when said slide is moved towards said die;

means for detecting a slide position;

drive means for moving said slide towards and away from said die; and

control unit means connected with all of said detector means for controlling the movement of said drive means in response to detection signals from all of said detector means.

4,489,579

MONITORING DEVICE AND PROCESS OF A METALLIC PART SUPERPLASTIC FORMING

Jean P. Daime, Boissy St. Leger, and Martial H. Lecler, Darvault, both of France, assignors to S.N.E.C.M.A., Paris, France

Filed Mar. 15, 1983, Ser. No. 475,694

Claims priority, application France, Mar. 17, 1982, 82 04862

Int. Cl.³ B21B *9/00*

U.S. Cl. 72—38 **10 Claims**

1. In a mold for the superplastic forming of a part from a blank, said mold including an inner surface having at least one recess angle and an opening for said blank, a device for monitoring said forming, said device comprising:

a sleeve fixed to said mold;

a hollow cylindrical tube slidable in said sleeve, one end of said hollow tube being positionable in contact with a central part of one side of said blank when said blank is in said mold;

means for providing high pressure fluid to the other side of said blank for forming said part;

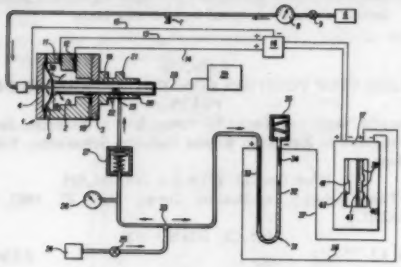
an axial array of at least two holes extending through a peripheral cylindrical wall of said hollow tube;

a delivery tube having one end extending through said sleeve for selective communication with said holes of said hollow tube when one of said holes registers with said delivery tube;

a low pressure gas source communicating with a second end of said delivery tube;

at least one first gas escape orifice in said hollow tube;

at least one second gas escape orifice in said mold;



a pressure drop detector in fluid communication with said delivery tube; and

a pressure recorder operatively connected to said pressure drop detector,

whereby the registry of one of said holes in said hollow tube with said delivery tube, due to distortion of said blank, causes a pressure drop in said delivery tube, said pressure drop being detected by said pressure drop detector and recorded by said pressure recorder.

4,489,580

METHOD FOR DEFORMING A FLAT SHEET METAL WORKPIECE

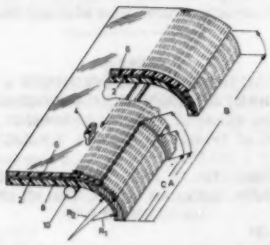
Siegfried Walter, Donauwörth, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Aug. 15, 1983, Ser. No. 523,340

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1982, 3231673

Int. Cl.³ B21D *31/06*; B23P *17/00*

U.S. Cl. 72—46 **8 Claims**



1. A method for deforming a flat workpiece such as a sheet metal workpiece by impact strokes applied to a surface of the workpiece while supporting the opposite workpiece surface, comprising the following steps, determining a surface pattern of the effective strengths of impacts of a tool required to be applied to one surface of the workpiece for shaping the workpiece. applying impact damping means to one surface of the workpiece, said impact damping means having damping characteristics which vary over the workpiece surface in accordance with said pattern, and applying a plurality of local deforming impacts impacts of uniform strength to the workpiece through said damping means for modifying the local deforming effect of said impacts over the entire surface of the workpiece.

4,489,581

METHOD OF MANUFACTURING ARTICLES BY DEFORMATION OF CYLINDRICAL BLANKS

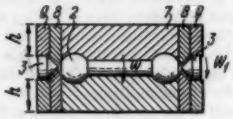
Alexandr N. Davidovich; Valery Y. Schukin; Valery A. Klushin; Vladimir I. Sadko, all of Minsk; Nikolai M. Skrebets, and Evgeny T. Murashko, both of Lida, all of U.S.S.R., assignors to Fiziko-Tekhnichesky Institut Akademi Nauk Belorusskoi SSR, U.S.S.R.

PCT No. PCT/SU81/00045, § 371 Date Jan. 7, 1983, § 102(e) Date Jan. 7, 1983, PCT Pub. No. WO82/04207, PCT Pub. Date Dec. 9, 1982

PCT Filed May 26, 1981, Ser. No. 459,610

Int. Cl.³ B21H *1/00*

U.S. Cl. 72—70 **2 Claims**



1. In a method for the manufacture of an article by deformation of a substantially cylindrical blank, comprising heating the blank, forming the blank and at least one end crop thereof, deforming the at least one end crop by application of at least one shearing blade thereto, separating the deformed end crop from the formed blank, and flashlessly forging the formed blank, the improvement comprising

separating the end crop from the formed blank by reducing speed of rotation of the end crop after deformation thereof, to a value in the range of between about 1/2.5 to 0 times the rotational speed of the formed blank.

4,489,582

METHOD FOR STRAIGHTENING DRAWN ROUND STOCK AND APPARATUS FOR THE PRACTICE OF THE METHOD

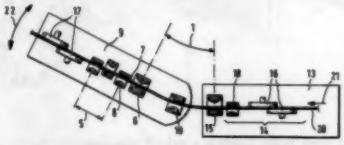
Johann Mostert, Eupen, Belgium, assignor to Firma Schumag GmbH, Aachen, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,456

Claims priority, application European Pat. Off., Jul. 17, 1982, 82106454.0

Int. Cl.³ B21D *3/02, 3/04*

U.S. Cl. 72—98 **12 Claims**



11. Method of straightening metal round stock comprising the steps of continuously advancing the stock to be straightened while simultaneously rotating said stock about its longitudinal axis, feeding said advancing stock through a first series of spaced apart straightening dies including at least a deflecting die and an exit die the dies of said first series being arrayed to form said stock into an arcuate configuration about a radius of curvature exceeding the yield point of said stock, whereby said stock enters said dies of said series in a first path and leaves said exit die of said first series in a second path diverging from said

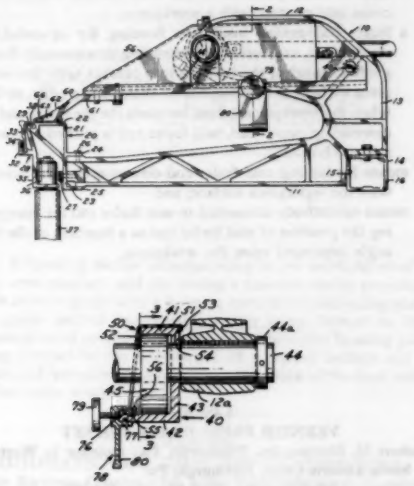
first path, and introducing said stock leaving said exit die of said first series into further straightening devices whereby said stock enters such further devices without substantial deflection from said second path.

4,489,583

PORTABLE SHEET BENDING BRAKE

James J. Rhoades, Garden City, Mich., assignor to Tapco Products Company, Inc., Detroit, Mich.

Filed Mar. 18, 1982, Ser. No. 359,566
Int. Cl.³ B21D 5/04
U.S. Cl. 72—319 45 Claims



27. A sheet bending brake adapted to be used by an operator facing the front of said brake comprising

a plurality of generally C-shaped frame members,

each said frame member including a long lower arm and a short upper arm overlying the lower arm,

each frame member including a recess along the rear edge of the lower arm,

a rear rail received in the recesses of said frame members and fastened thereto,

a first member defining a clamping surface extending longitudinally,

said first member having an integral C-shaped portion into which the forward end of the lower arms of the frame members extend,

a bending member,

means hinging said bending member to said first member,

a plurality of bars with a bar individual to each said frame member and having its rear end pivoted to said frame member adjacent the rear of said upper arm and having its front end extending forwardly toward the operator,

an anvil member extending longitudinally of said sheet bending brake and fixed to said bars,

each said bar being generally C-shaped and including an upper horizontal flange, a lower horizontal flange and a vertical wall connecting said flanges,

a shaft journalled in the forward ends of the upper arms of said C-shaped members and extending through the vertical walls of said bars,

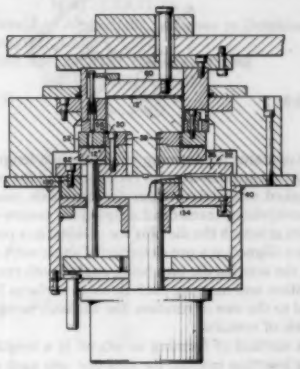
a cam fixed on said shaft individual to each said bar and positioned to cooperate with the upper and lower flanges such that rotation of said shaft pivots said bars and, in turn, said anvil member into and out of clamping position.

4,489,584

SINGLE STROKE, DRAW AND TRIM DIE ASSEMBLY

Owen M. Gall; Thomas L. Thomson, and Robert S. Taylor, all of Columbus, Ind., assignors to Hartup Tool, Inc., Columbus, Ind.

Filed Dec. 2, 1982, Ser. No. 446,313
Int. Cl.³ B21D 24/16
U.S. Cl. 72—327 16 Claims



1. A die assembly for drawing and trimming sheet material, comprising

(a) a first die means for applying to one surface of the sheet material a draw forming force in one direction along a draw forming axis, said first die means including a fixed draw punch over which sheet material is drawn;

(b) a second die means mounted for reciprocal movement relative to said first die means between a retracted position and an advanced position along said draw forming axis for applying to the other surface of the sheet material an opposing draw forming force to draw form the sheet material into a desired shape as said second die means moves from its retracted position to its advanced position said second die means including a draw ring having an interior aperture configured to complement the exterior shape of said draw punch and allow said draw ring to telescopically advance over said draw punch as said second die means moves from its retracted to its advanced position; and

(c) trimming means for cutting away a portion of the drawn sheet material when said second die means is in its advanced position, said trimming means including

(1) a trim die ring having a first trim cutting edge in the shape of the sheet material portion to be cut, said trim die being mounted in a fixed position of one of said die means, and

(2) a trim punch having a second trim cutting edge, said trim punch being mounted on the other said die means for movement in a trim plane generally transverse to said draw forming axis to create a shear cutting action between said first and second trim cutting edges to trim the drawn sheet material in a plane transverse to said draw forming axis, said draw ring being mounted for limited movement in said trim plane in response to movement of said trim punch.

4,489,585

PRODUCTION OF TUBULAR MEMBERS

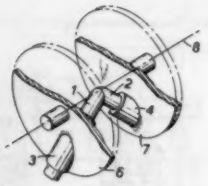
Nicholas J. Palmer, Islip, and Anthony R. H. Pocock, Medbourne, both of England, assignors to British Steel Corporation, England

Filed Dec. 6, 1982, Ser. No. 447,189

Claims priority, application United Kingdom, Dec. 11, 1981, 8137531

Int. Cl.³ B21D 9/05

U.S. Cl. 72—387 10 Claims



1. Apparatus for forming an elbow in a length of pipe comprising two internal die pins each mounted for rotation as limbs of cranked assemblies, about the same axis, said crank assemblies comprising crank discs adapted for contra-rotation from a position at which the die pins are co-axial to a position at which they are aligned at a pre-determined angle with respect to each other, the internal die pins being angled with respect to the axis of rotation and meeting each other in surfaces lying in a plane normal to the axis of rotation, the surfaces being intersected by said axis of rotation.

7. A method of forming an elbow in a length of pipe comprising inserting internal die pins one into each end of the pipe such that they meet at mutually inclined surfaces at their inner ends; and turning the internal die pins with respect to each other by means of a contra-rotating crank mechanism such that the inclined surfaces continue to abut, whereby to bend the pipe at the inter-connecting inclined surfaces until the pipe is at the required pre-determined angle.

4,489,586

DEVICE FOR MEASURING THE FOLD ANGLE IN A SHEET METAL BENDING PRESS

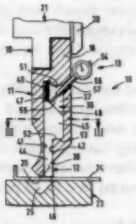
Johann Hess, Talstrasse 26, 7057 Leutenbach, Fed. Rep. of Germany

Filed Mar. 9, 1981, Ser. No. 241,689

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1980, 3008701

Int. Cl.³ B21D 5/02

U.S. Cl. 72—389 14 Claims



1. In a sheet metal bending press of the type in which a press head forces the sheet metal workpiece downwardly into a V-shaped groove of a die block and the distance of penetration into said groove is adjustable, in order to achieve a correspondingly wider or narrower fold angle, and where the press head has an elongated beam-like shape with a straight, continuous horizontal bending edge at the lower extremity of its cross-sectional outline and a mounting profile at its upper extremity adapted for the releasable attachment of its press head to the press ram, in such a bending press, a fold angle measuring device comprising in combination:

a narrow vertically elongated housing having a bending edge at its lower extremity and a mounting profile at its upper extremity, so as to be attachable to the press ram in the same manner as the press head, in a longitudinally contiguous relationship with the latter, whereby the bending of the housing forms a continuation of the bending edge of the press head and the outline of the housing matches the cross-sectional outline of the press head, at least in those portions of the head outline which could come into contact with a workpiece;

a feeler rod guided inside the housing for up-and-down movements, said feeler rod extending downwardly from a guide channel of the housing into contact with the workpiece surface, at a distance form the bending edge, so that, when the workpiece is bent between the die block and the descending press head, said feeler rod is pushed upwardly into the housing;

means for biasing said feeler rod downwardly into contact with the workpiece surface; and

means operatively connected to said feeler rod for interpreting the position of said feeler rod as a function of the fold angle impressed upon the workpiece.

4,489,587

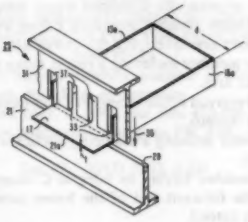
VERNIER PRESS BRAKE DIE SET

Robert H. Sturges, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 14, 1983, Ser. No. 474,935

Int. Cl.³ B21D 5/01

U.S. Cl. 72—389 5 Claims



1. A bending apparatus comprising a first member and a second member disposed to receive said first member therein such that a sheet of bendable material disposed therebetween is bent to a desired form when said first member is received by said second member, at least one of said members having an integer section and a vernier section extending in opposite directions along the sheet material contacting edge of said member, said integer section having a plurality of slots along said edge, spaced a predetermined metric distance apart and said vernier section having a plurality of slots along said edge, incrementally spaced from a datum a distance corresponding to a multiple of the sum of said predetermined metric distance plus a selected fraction of said distance, each of said slots having a predetermined width which is equal to the sum of the selected metric fraction plus the thickness of the bendable material.

4,489,588

APPARATUS FOR MANUFACTURING SCREW WORKPIECES OF A TUBE SEMI-PRODUCT

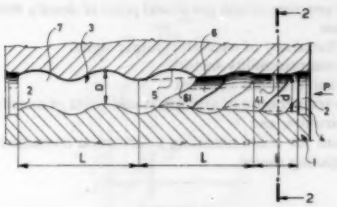
Josef Svercl, Olomouc; Jan Novak, Trebcin, and Stepan Zampach, Loucany, all of Czechoslovakia, assignors to SIGMA koncern, Olomouc, Czechoslovakia

Filed Mar. 30, 1983, Ser. No. 480,463

Claims priority, application Czechoslovakia, Mar. 31, 1981, 9357-81

Int. Cl.³ B21K *1/12*

U.S. Cl. 72—402 **4 Claims**



1. A forming die for manufacturing screw workpieces of a tube semi-product, said die having a function cavity provided with an inlet guide part, a forming part, and a calibrating part, the guide part of the function cavity being formed by the intersection of cylindrical surface and a helix, the forming part being formed by the intersection of a conical surface and a helix, and the calibrating part being of a shape of the final helix of the screw workpiece.

4,489,589

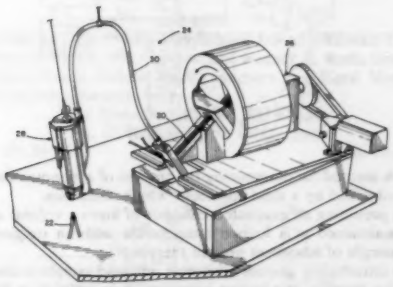
AUTOMATIC WIRE JOINT INSTALLATION TOOL

Peter Kirsinas, Country Club Hills; John J. Brouwer, Lansing; Richard M. Purpura, Park Forest, and Donald C. Wiencek, Crestwood, all of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Jun. 28, 1982, Ser. No. 392,966

Int. Cl.³ B21D *43/02*

U.S. Cl. 72—424 **28 Claims**



1. Apparatus for applying wire joints, of the type having a crimpable metallic ferrule, to the ends of wires, said apparatus comprising:

feeder means for holding a supply of said joints,

a tool, remote from said feeder means, for applying said joints by crimping, and

conveyor means interconnecting said feeder means and said tool for conveying said joints in series, said tool comprising a crimping station and first and second crimping members relatively movable between an open position and a crimping position for applying a joint held at said crimping station, said tool further comprising positive wire joint advance means responsive to said crimping members moving toward said open position to advance the next upstream wire joint to said crimping station without regard to the orientation of said tool, each wire joint comprising an insulative housing having a ferrule retaining end and an open skirt end extending therefrom and having a greater diameter than said ferrule retaining end, said feeder means comprising orientation means for presenting said joints skirt end first to said conveyor means.

4,489,590

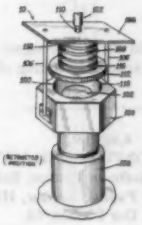
METHOD AND APPARATUS FOR GAS DETECTOR CALIBRATION

David M. Hadden, Los Altos, Calif., assignor to Delphian Corporation, Sunnyvale, Calif.

Filed Jan. 25, 1982, Ser. No. 342,048

Int. Cl.³ G01N *37/00*

U.S. Cl. 73—1 G **8 Claims**



1. A method for application of calibration gas to a combustible gas sensor which is normally positioned in a sampling recess and which is normally exposed to the ambient atmosphere through a porous sampling surface, comprising the steps of:

applying pressurized calibration gas to the interior of a chamber which extends in response to said application of pressurized calibration gas and forming a calibration enclosure surrounding the sampling surface in mechanical response to said application by covering said recess in response to said application of pressurized calibration gas,

introducing calibration gas into said calibration enclosure for calibration of said sensor, and

stopping the application of pressurized calibration gas and opening the calibration enclosure to reexpose the sampling surface of the combustible gas sensor to the ambient atmosphere.

4,489,591

ANGLE OF AIRFLOW VANE POSITIONER

Charles C. Myrick, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1982, Ser. No. 429,874

Int. Cl.³ G01C *25/00*

U.S. Cl. 73—1 E **2 Claims**

1. A system for measuring the angle of airflow of an airflow vane in an aircraft comprising in combination:

a vane positioner head including a control arm coupled to the airflow vane;

a controller circuit;

a gear train and stepper motor coupled between said control arm and said controller circuit;

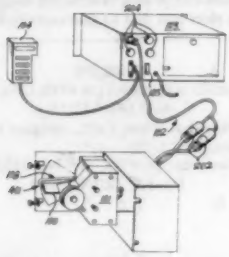
a logic circuit having a plurality of input terminals, and an output terminal for providing a clockwise signal representative of positive or negative angle positioning of said vane;

a fine interrupting vane and a coarse interrupting vane coupled to said gear train;

a first optical coupled interrupter coupled between said fine

interrupting vane and a first of said plurality of input terminals;

second and third optical coupled interrupters coupled between said coarse interrupting vane and second and third of said plurality of input terminals; and,



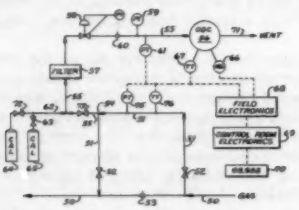
means for coupling said clockwise signal representative of positive or negative angle positioning of said vane to said controller circuit.

4,489,592

DENSITY MONITOR AND METHOD

Ronald F. Pacanowski, Hoffman Estates; Robert W. Sampson, Arlington Heights, and Paul J. Kuchar, Hinsdale, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Feb. 22, 1983, Ser. No. 468,787
Int. Cl.³ G01N *9/32*
U.S. Cl. 73—30 **8 Claims**



1. An apparatus for determining the density of a gas comprising:

(a) a fluidic oscillator;

(b) means for establishing flow of a sample of the gas through said oscillator;

(c) means for controlling the pressure at which the sample passes through said oscillator;

(d) means for measuring the temperature of the sample at said oscillator and transmitting a signal representative of the temperature, said temperature being designated as T;

(e) means for measuring the frequency of oscillation at said oscillator and transmitting a signal representative of the frequency, said frequency being designated as F;

(f) means for determining the temperature of said gas at the point at which said density is determined and transmitting a signal representative of the temperature, said temperature being designated as T_1;

(g) means for measuring the pressure of said gas at said point of density determination and transmitting a signal representative of said pressure, said pressure being designated as P_1;

(h) computing means for calculating the density of said gas by the relationship of P_1, T, T_1 and F in accordance with the equation

$$D = \frac{K_1GTP_1 + K_2P_{11}F^2}{F^2ZRT_1}$$

wherein,

D=density of said gas

K_1=a constant

G=specific heat ratio of said gas flowing through said oscillator

T=temperature of said gas flowing through said oscillator

P_1=pressure of said gas at said point of density determination

F=frequency of oscillator output signal

Z=compressibility factor

R=universal gas constant

T_1=temperature of said gas at said point of density determination; and

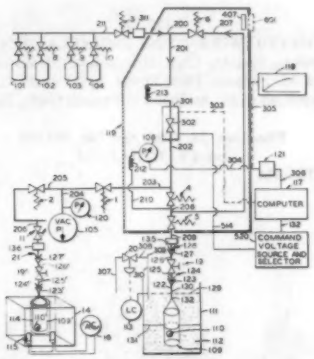
(i) means for communicating information contained in said computing means.

4,489,593

METHOD AND APPARATUS FOR DETERMINING THE AMOUNT OF GAS ADSORBED OR DESORBED FROM A SOLID

Wim J.M. Pieters, Morristown, and William E. Gates, Somerset, both of N.J., assignors to Omicron Technology Corporation, Berkeley Heights, N.J.

Filed Sep. 9, 1982, Ser. No. 416,164
Int. Cl.³ G01N *15/08*
U.S. Cl. 73—38 **54 Claims**



1. A method for determining the amount of a gaseous adsorbate adsorbed by a solid adsorbent which comprises:

(a) providing an evacuated chamber of known volume and maintained at a known temperature with an outgassed sample of adsorbent present therein;

(b) introducing gaseous adsorbate into said sample containing chamber at a known substantially constant mass flow rate for a time sufficient to obtain adsorption of at least a portion of said adsorbate by said adsorbent, said mass flow rate being not greater than the equilibration rate of adsorption of the adsorbate by the adsorbent and not greater than about 0.7 ml/min at standard temperature and pressure conditions;

(c) establishing the equilibrium pressure of said adsorbate as it is introduced into said chamber as a function of time, said equilibrium pressure being the sampled chamber pressure; and

(d) correlating the adsorbate sampled chamber pressure, the adsorbate mass flow rate, and the time needed to attain said sampled chamber pressure with the amount of adsor-

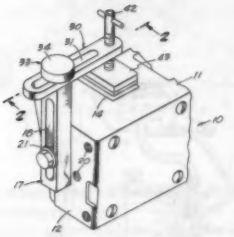
bate adsorbed by the adsorbate at said sampled chamber pressure.

4,489,594

PAD CLAMP FOR CLOSING OFF WATER PORT IN ENGINE BLOCK

Jeffrey G. Smith, Velinda, Calif., assignor to Irontite Products Co., Inc., El Monte, Calif.

Filed May 3, 1983, Ser. No. 482,132
Int. Cl.³ G01M *3/04*
U.S. Cl. 73—49.7 **4 Claims**



1. A port closing clamp means for sealing a surface port of an engine cylinder head or block or other engine part which may be positioned to have a horizontal surface in which a port of a water circulating conduit is located and having a side surface extending from said horizontal surface which side surface has at least one threaded opening therein which is spaced a distance from said horizontal surface, said clamp comprising:

a. mounting means removably secured to said side surface of the engine part and extending therefrom to a position above said horizontal surface;

b. an arm above said horizontal surface;

c. means for rotatively and longitudinally mounting said arm at the upper end and on said mounting means;

d. a port closure member adapted to close said port and;

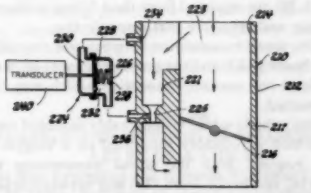
e. tightening means on said arm for tightening said port closure member against said horizontal surface to close said port.

4,489,595

ENGINE AIR INLET PRESSURE MEASUREMENT

Edward D. Klomp, Mt. Clemens, and Rodney B. Rask, Grosse Pointe Woods, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 28, 1983, Ser. No. 479,170
Int. Cl.³ G01M *15/00*; G01L *7/08*
U.S. Cl. 73—115 **10 Claims**



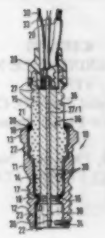
1. The method of measuring the pressure of air delivered to an engine having an inlet body forming an induction passage for air flow to the engine and a throttle in said induction passage controlling air flow therethrough, said inlet body having a reduced pressure port opening from a region of said induction passage through which the air flow occurs at sonic velocity during particular engine operating conditions, said method comprising the step of measuring the difference between the pressure upstream of said throttle and the pressure at said reduced pressure port during said engine operating conditions to thereby provide a measure of the absolute value of the pressure of the air delivered to the engine.

4,489,596

SPARK PLUG WITH MEASURING MEANS

Ernst Linder, Mühlacker; Helmut Maurer, Vaihingen, and Klaus Müller, Tamm, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 24, 1983, Ser. No. 478,267
Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3217951
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—116 **18 Claims**



1. Spark plug for an internal combustion engine having

a tubular metal housing (11, 11', 11") having a terminal end and an ignition end;

a ground or counter electrode (24, 24', 24/1, 24"/1, 24"/2) located adjacent the ignition end;

an insulator (15, 15', 15") secured in the housing, said insulator being formed with a central opening (36);

and an ignition electrode (25, 25', 25") secured in the insulator and having an ignition end portion spaced from the ground or counter electrode by a spark gap, and a terminal end portion having terminal means for connection to a source of spark energy,

comprising, in accordance with the invention,

at least one elongated insulated carrier element (37/1, . . .) having the form of a substantially flat plate or layer and being secured and sealed in the opening (36) of the insulator (15) and extending lengthwise thereof, said ignition electrode being positioned in the opening (36) of the insulator (15) by said elongated insulator carrier element and located in relation to the ground or counter electrode (24, . . .) by said carrier element.

4,489,597

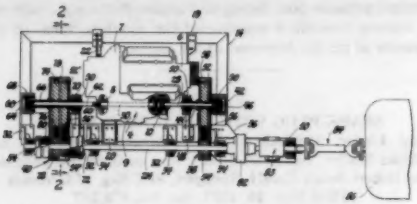
VEHICLE DRIVE TRAIN TEST APPARATUS

Ellard D. Davison, Jr., Grosse Pointe Farms, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 8, 1983, Ser. No. 512,024
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—118 **2 Claims**

1. Test apparatus for selectively operating a drive train including a differential to drive a pair of shafts with and without differential action comprising a test load, first overdrive means adapted to connect one of said shafts to drive said load with a predetermined overdrive ratio, and selectively engageable second overdrive means adapted to selectively connect the other of said shafts to drive said load with a predetermined overdrive ratio equal to said first-mentioned overdrive ratio and, alternatively, with a different overdrive ratio whereby

said load is connectable to be driven by said differential at a faster speed than said shafts with and alternatively without



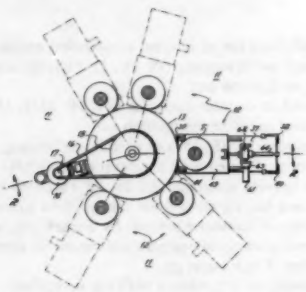
forced differential action by selective operation of said second overdrive means.

4,489,598

TIRE ROLLING RESISTANCE MEASUREMENT SYSTEM

James C. Beebe, Medina, and Barry D. Cargould, Akron, both of Ohio, assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed May 9, 1983, Ser. No. 492,644
Int. Cl.³ G01M *17/02*
U.S. Cl. 73—146 **9 Claims**



4. An apparatus for measuring the rolling resistance of tires comprising:

a cylindrical roadwheel rotatable on a base about a vertical axis in a horizontal plane and having a vertical tire-engaging surface about its perimeter;

a spindle assembly for receiving a tire for horizontal rotation about a vertical axis;

a table fixed relative to the roadwheel base;

a platform freely slidable to at least a limited degree in a horizontal plane on the table;

a carriage on the platform carrying the spindle assembly;

means for moving the carriage relative to the platform in a horizontal direction toward and away from the road wheel perimeter;

a linkage structure coupled between the roadwheel base and the platform, the linkage structure being attached to the roadwheel base such that instantaneous movement of the platform relative to the roadwheel base is about the axis of rotation of the roadwheel on a low static friction bearing;

means, in the linkage structure, for measuring a radial reaction force indicative of the loading force on a tire; and

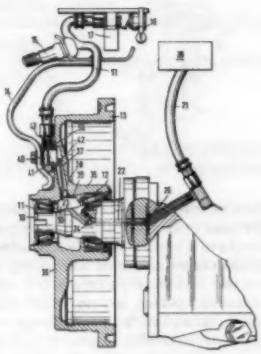
means for measuring a force, perpendicular to the radial reaction force, indicative of the rolling resistance force of a tire.

4,489,599

DEVICE FOR MONITORING THE INFLATION PRESSURE IN A TIRE OF A VEHICLE WHEEL

Marcel Andrei-Alexandru, and Hans Prohaska, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Mar. 10, 1983, Ser. No. 474,049
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213552
Int. Cl.³ B60C *23/02*
U.S. Cl. 73—146.5 **3 Claims**



1. A device for monitoring the inflation pressure in a tire of a vehicle wheel, which is rotatably supported on a stationary part via at least one rolling bearing consisting of an outer ring, an inner ring and several rolling bodies from electrically conductive material, comprising a pressure sensor in the tire, the pressure-dependent electric signal of which pressure sensor is transmitted to a stationary signal-evaluating stage, wherein

the signal transmission is effected via a rolling bearing (**12**) carrying the wheel (**14**), one ring (**33**) of said rolling bearing being connected in an electrically conductive manner to the pressure sensor (**16**) and its other ring (**30**) to the signal-evaluating stage (**20**), whereby the inner and outer ring (**33, 30**) are insulated from their fitting surfaces on the stationary and rotatable part respectively;

wherein the signal transmission between one ring (**33**) of the rolling bearing (**12**) and the pressure sensor (**16**) is effected via at least one contact connection which may be easily disconnected;

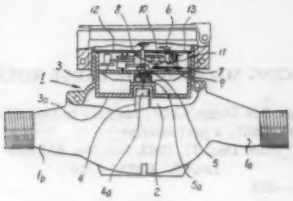
wherein the vehicle wheel is detachably mounted on a brake drum which is rotatably supported on a kingpin via the rolling bearing, both the signal transmission between wheel (**14**) and brake drum (**13**) and between brake drum (**13**) and one ring (**33**) of the rolling bearing (**12**) carrying the brake drum (**14**) is effected via a contact connection which may be easily disconnected; and

wherein a two-legged contact spring is insulatedly fixed on the brake drum (**13**), the one leg (**39**) of which spring rests resiliently against a ring (**33**) of the rollihng bearing (**12**) and the other leg (**42**) against a contact (**41**) insulatedly fixed on the wheel (**14**).

4,489,600
WATER METER WITH AN ANTI-REVERSE-ROTATION DEVICE

Eui M. Han, Seoul, Rep. of Korea, assignor to Shinhan Kongki Co., Ltd., Incheon, Rep. of Korea

Filed Mar. 3, 1983, Ser. No. 471,851
Claims priority, application Rep. of Korea, Sep. 3, 1982, 1982-6976[U]
Int. Cl.³ G01F *1/075, 15/06*
U.S. Cl. 73—275 **4 Claims**



1. A magnet-rotor type water meter with an anti-reverse-rotation device comprising:

a rotor chamber accommodating a rotor with rotor shaft wherein said rotor shaft is provided with a ferrite magnet securely inlaid onto the upper end thereof,

a hermetically enclosed inner casing located above said rotor chamber,

a scale plate mounted on the upper end of said inner casing,

an instrument gear assembly housed in said inner casing wherein said instrument gear assembly includes a central main shaft and a pointer driving gear, said central main shaft being provided with a ferrite magnet securely inlaid onto the lower end thereof and said pointer driving gear being provided with an instrument pointer securely mounted on the upper end of the gear shaft of said pointer driving gear,

whereby said ferrite magnet magnetically cooperates with said ferrite magnet as said rotor shaft is rotated and thereby said central main shaft is rotated to drive said instrument gear assembly and thus to rotate said instrument pointer, and

characterized in that one or more stepped back stops are formed on the annular upper side of said pointer driving gear, and each of said stepped back stops is gradually sloped down in the normal rotational direction R_1 to form an inclined plane, and one or more stop pin cylinders are provided on the underside of said scale plate in the vicinity of the upper gear shaft, and one or more stop pins are slidably inserted each into said stop pin cylinders, whereby the lower ends of said stop pins smoothly slide on said inclined planes while moving up- and downward within said stop-pin cylinders due to the cam action of said inclined planes without preventing the rotation of said pointer driving gear in the normal direction R_1, whereas said stepped back stops are caught by said stop pins, thereby preventing the reverse rotation of said pointer driving gear when rotating in the reverse direction R_2.

4,489,601
APPARATUS AND METHOD OF MEASURING THE LEVEL OF A LIQUID

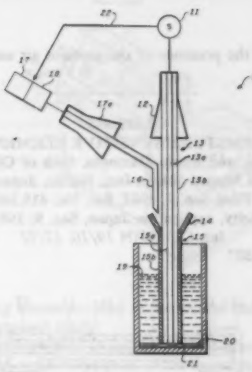
B. Rama Rao, Lexington, and Kenneth W. Robbins, Wilmington, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 18, 1983, Ser. No. 514,743
Int. Cl.³ G01F *23/28*
U.S. Cl. 73—290 R **6 Claims**

1. An apparatus for measuring the height of a liquid in a container above a reference level comprising,

first transmission line means coupled to receive short pulses for propagation in a first mode,

second transmission line means coupled at a first end to said first transmission line, and coupled to signal reflecting means at a second end at the bottom of the container, said second transmission line means having an inner conductor and an outer conductor with inner and outer surfaces, for propagating pulsed signals therealong, means for launching short pulses in a second mode between said inner conductor and said inner surface of said outer conductor and for launching short pulses in said first mode to said outer surface of said outer conductor whereby:



pulses in said first mode propagating on said outer surface of said outer conductor are reflected from said surface of said liquid and short pulses in said second mode propagating between said inner conductor and said inner surface of said outer conductor are reflected from said signal reflecting means,

means for coupling said first mode reflected pulses and said second mode reflected pulses from said second transmission line means to said first transmission line means in said first mode for propagation therealong,

receiver means coupled to said first transmission line for detecting said reflected pulses and for determining said liquid level therefrom.

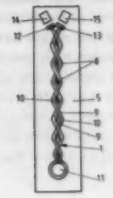
4,489,602
ROD-LIKE APPARATUS FOR DETERMINING THE EXISTING LEVEL OF LIQUIDS IN CONTAINERS, CHANNELS, OR THE LIKE

Wolfram Henning, Neumarkter Strasse, 8501 Allersberg (BRD), Fed. Rep. of Germany

Filed Nov. 9, 1982, Ser. No. 440,402
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1981, 3144541
Int. Cl.³ G01F *23/02*
U.S. Cl. 73—327 **8 Claims**

1. Apparatus for determining the level of a liquid in a container, channels and the like with a lightguide vertically supported in the liquid by means in the container and having a core of transparent material through which light may be transmitted between a transmitter and a receiver characterized by the lightguide being formed in an undulating manner with a plurality of vertically spaced relatively curved regions connected by relatively straight regions and wherein said curved regions are curved to an extent such that conditions for total internal reflection of light exist there in the presence of ambient air in the container while conditions for total internal reflection of light do not exist there in the presence of the ambient liquid

and wherein said relatively straight regions are straight to an extent such that conditions exist for total internal reflection of



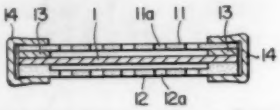
light in both the presence of the ambient air and ambient liquids.

4,489,603

MOISTURE SENSITIVE ELEMENT

Akira Fukami, and Kunio Okamoto, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 7, 1982, Ser. No. 415,546
Claims priority, application Japan, Sep. 9, 1981, 56-142007
Int. Cl.³ G01N *19/10, 27/12*
U.S. Cl. 73—337 **17 Claims**



1. A moisture sensitive element, comprising:

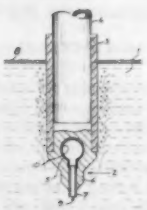
a sheet made from a mixture of electrically insulating fibers having a property of expanding upon absorbing moisture and electroconductive fibers having a length of 1–5 mm, the ratio of the electrically insulating fibers being 30% or more of the total fiber mixture in the sheet, and the ratio of the electroconductive fibers being 10% or more of the total fiber mixture in the sheet.

4,489,604

APPARATUS FOR TESTING AND TAKING SAMPLES FROM LIQUID METAL

Lars Kumbrant, Orsundsbro; Gunnar Olofsson, and Mats Larsson, both of Laxa, all of Sweden, assignors to Rockwool Aktiebolaget, Skovde, Sweden

Filed Aug. 9, 1982, Ser. No. 406,371
Claims priority, application Sweden, Aug. 31, 1981, 8105033
Int. Cl.³ G01N *1/12*
U.S. Cl. 73—432 R **12 Claims**



1. In apparatus for testing or sampling a molten metal comprising testing means or sampling means adapted to be immersed into a molten metal, said apparatus including thermal protection means surrounding said testing means or sampling means for protecting said testing means or sampling means from the heat of said molten metal when said apparatus is immersed in said molten metal, the improvement wherein

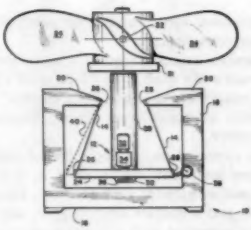
said thermal protection means comprises mineral wool and a substance distributed in said mineral wool which substance spontaneously decomposes and emits gas and when said substance is contacted with molten metal upon immersion of said apparatus therein.

4,489,605

BALANCING MACHINE FOR LARGE ROTATABLE PARTS

Earl A. Kops, San Diego, Calif., assignor to Donald O. Gillman, San Diego, Calif., a part interest

Filed Dec. 27, 1982, Ser. No. 453,600
Int. Cl.³ G01M *1/16*
U.S. Cl. 73—455 **10 Claims**



1. A machine for precisely determining the static balance of large rotatable parts which comprises:

a vertical rotatable arbor adapted to support a large rotatable part;

a swing means supporting said arbor;

means for aligning the center of said part with the axis of rotation of said arbor;

support means spaced from said arbor and higher in elevation than said swing means said support means comprises a generally horizontal base member and two spaced upstanding posts with two inwardly extending arms at the top of said posts;

at least two spaced thin sheet metal tension members attached to said swing means and to said support means, each of said tension members is secured to said arms and lower plates by a clamping means comprising an elongated spacer bar adapted to having an end of a tension member wrapped 180° therearound, the edge of said spacer bar around which said tension member is wrapped having approximately semi-circular cross-section, two clamping plates arranged in contact with said tension member on opposite sides of said spacer bar, a plurality of fasteners extending through said clamping plates, tension member and spacer bar to hold them together in a tight clamping relationship and means for securing at least one of said clamping plates to the appropriate arm or lower plate;

said tension members extending upwardly and inwardly from said swing means to said support means whereby said swing means hangs from said support means;

said tension members arranged to permit said swing means to deflect in one direction and retain said swing means in another direction; and

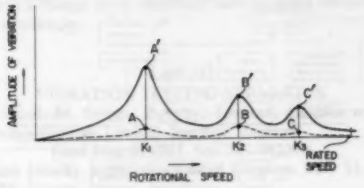
measuring means for measuring deflection of said swing assembly.

4,489,606

METHOD OF AND SYSTEM FOR BALANCING A ROTOR

Kouki Shiohata, Ibaraki; Fumio Fujisawa, Mito; Takashi Watanabe, and Yasumasa Ishibashi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 26, 1982, Ser. No. 401,720
Claims priority, application Japan, Jul. 27, 1981, 56-116342
Int. Cl.³ G01M 1/22
U.S. Cl. 73—462 **16 Claims**



1. A rotor balancing method for reducing excessive amplitude of unbalanced vibration occuring in a rotor of a rotary machine, the method comprising the steps of:

actually measuring an unbalance vibration amplitude of said rotor;

judging whether a desired level is exceeded by the actually measured unbalance vibration amplitude;

selecting at least one of a plurality of correction plane combinations each having at least any two of the correction planes preset on said rotor, based on said actually measured vibration amplitude, when said desired level is exceeded by said actually measured unbalance vibration amplitude;

computing a correction mass to be added to said rotor, using one of a plurality of influence coefficients preset to the respective correction plane combinations, corresponding to said at least one selected correction plane combination;

computing on an assumption that said correction mass is added to said rotor, estimated residual vibration amplitudes and root mean squares of said estimated residual vibration amplitude;

comparing combinations of maximum values of said estimated residual vibration amplitudes and said root mean squares of said estimated residual vibration amplitudes corresponding respectively to correction plane position combinations with said desired level; and

selecting an appropriate correction plane position combination corresponding to at least one of said combinations of the maximum values and the root mean squares of said estimated residual vibration amplitudes which is below said desired level, the step of selecting said correction plane position combination includes selecting an optimum correction plane position combination corresponding to one of at least two combinations of the maximum value and the root means squares which has the minimum amplitude, so that an optimum correction mass is formed by said optimum correction plane position combination ans said correction mass; and

attaching said correction mass to said rotor.

4,489,607

DYNAMIC VEHICLE TIRE AND WHEEL BALANCING SYSTEM

Hyo-Sup Park, 1078 Thorndale Ct., San Jose, Calif. 95121

Filed May 23, 1983, Ser. No. 497,043
Int. Cl.³ G01M 1/08, 1/18
U.S. Cl. 73—462 **8 Claims**

1. A vehicle tire and wheel balancing system for indicating the amount and position of weights needed for proper wheel balance, said system comprising:

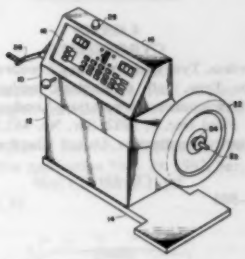
a housing;

a cylindrical member horizontally positioned within said housing;

pivot means supported by said housing and supporting a point on said cylindrical member's circumference located approximately midway to the length of said cylindrical member;

suspension means attaching said cylindrical member to said housing, said suspension means restricting the vertical movement of said cylindrical member;

a rotatable shaft coaxially journaled within said cylindrical member for rotation therein, said shaft having a first end extending therefrom for concentrically mounting a vehicle wheel thereto;



shaft rotating means coupled to the second end of said shaft for rotating said shaft;

a speed sensor coupled to said shaft, said sensor generating an electric signal indicative of the rotational velocity of said shaft;

at least one transducer coupled to said cylindrical member to sense the amplitude of horizontal oscillatory vibrations in shaft resulting from imbalances in a rotating vehicle wheel mounted on the first end of said shafts, said transducer generating electrical signals indicative of said imbalances; and

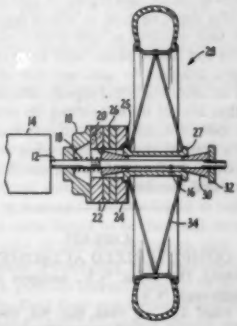
computing means responsive to said speed sensor and said transducer for computing and indicating the balance weights necessary for eliminating said imbalances.

4,489,608

CYCLE WHEEL MOUNTING FIXTURE

Willy Borner, Cupertino, Calif., assignor to Balco, Inc., San Jose, Calif.

Filed Sep. 16, 1983, Ser. No. 533,136
Int. Cl.³ G01M 1/06
U.S. Cl. 73—487 **22 Claims**



1. A mounting fixture for enabling a cycle wheel to be positively mounted without damage on the spindle of a dynamic

wheel balancer having a flange which provides a support plane, comprising:

first and second means for respectively engaging the opposite ends of the hub of a cycle wheel and centering the wheel on said spindle;

means for resiliently biasing one of said wheel engaging and centering means in an axial direction along said spindle towards the other of said wheel engaging and centering means; and

at least one axially compressible pressure ring adapted to be coaxially supported on said spindle between said flange and a cycle wheel and thereby provide positive yet resilient engagement between said flange and said wheel such that the wheel and the spindle rotate in unison.

4,489,609

GYROSCOPES

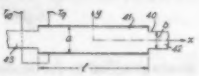
James S. Burdess, Tyne and Wear, and Leonard Maunder, Newcastle upon Tyne, both of England, assignors to National Research Development Corporation, London, England

Filed Dec. 7, 1982, Ser. No. 447,717

Claims priority, application United Kingdom, Dec. 8, 1981, 8137001

Int. Cl.³ G01C *19/56*

U.S. Cl. 73—505 **4 Claims**



1. A gyroscopic device comprising:

an elongated member of substantial length and substantially rectangular transverse section, exhibiting the piezoelectric effect and attached at at least one of its ends to supporting structure;

exciting electrodes attached to said member at a region remote from its said attachment to said fixed structure;

means using the said piezoelectric effect and said exciting electrodes to excite said region of said member into oscillations of a shearing type in which transversely-opposite faces of said member at said region oscillate in parallel directions but out-of-phase with each other, and sensing electrodes attached to said member at said region and adapted to sense electrical signals indicative of the inertia forces that are set up in said region of said member and that act along the said length of said member when a rate of turn is applied about an axis lying normal both to the said directions of said shearing oscillations and to said length of said member.

4,489,610

COMPUTERIZED AUDIOMETER

Martin J. Slavin, Dix Hills, N.Y., assignor to Intech Systems Corp., Hauppauge, N.Y.

Filed Apr. 11, 1984, Ser. No. 599,152

Int. Cl.³ H04R *29/00*

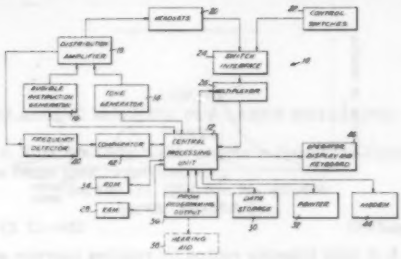
U.S. Cl. 73—585 **15 Claims**

1. A computerized audiometer comprising at least one head set;

a control switch actuable by the person being tested and associated with each head set;

tone generator means for applying a predetermined sequence of tones of varying frequency and amplification to said at least one head set for conducting an audiometric test; and

a central processing unit coupled to said control switch for detecting the actuation thereof in coordination with the



operation of the tone generator means, said central processing unit being adapted to process the outputs of said control switch and determine a program representative of the corrections required by the person being tested in terms of frequency band and amplification within each frequency band in a form suitable for programming a programmable hearing aid to conform to the correction required by the person being tested.

4,489,611

MATERIAL TESTING APPARATUS USING ULTRASONIC TESTING HEADS

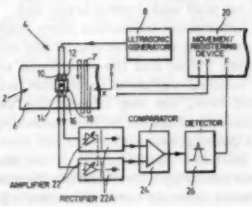
Werner Zimmermann, and Helmar Langer, both of Munich, Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Jan. 20, 1983, Ser. No. 459,391

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3203862

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—625 **5 Claims**



1. A testing apparatus for testing materials and structural components having irregular cross-sections, comprising testing means including first and second ultrasonic testing receiver heads **(14, 16)** operating in synchronism, first and second ultrasonic transmitter heads **(10, 12)** also operating in synchronism with each other for transmitting ultrasonic wave energy to be received by said first and second ultrasonic testing receiver heads, and means **(18)** for operatively supporting said first and second ultrasonic testing receiver heads and said first and second ultrasonic transmitter heads in a fixed position relative to each other and relative to an item to be tested, said apparatus further comprising means operatively arranged for allowing relative movement in a defined direction (y) between said testing means and an item to be tested, said first and second

ultrasonic testing receiver heads (14, 16) being spaced from each other on said supporting means (18) in a direction (x) extending substantially perpendicularly to said defined direction (y) of relative movement, said first and second ultrasonic transmitter heads (10, 12) being spaced from their respective ultrasonic receiver head (14, 16) in the defined direction (y) of relative movement, and comparing means (22, 24, 26) operatively connected to said testing receiver heads (14, 16) for comparing an output signal amplitude from said first testing receiver head with an output signal amplitude from said second testing receiver head and for producing a fault signal in response to a change in the amplitude ratio between the received signal amplitudes.

4,489,612

VIBRATION TESTING APPARATUS

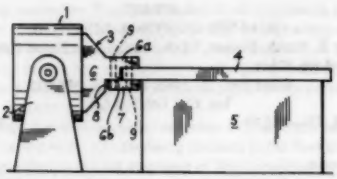
Frederick J. M. Griggs, Royston, England, assignor to Ling Dynamic Systems Limited, Royston, England

Filed May 9, 1983, Ser. No. 492,834

Claims priority, application United Kingdom, May 12, 1982, 8213771

Int. Cl.³ B06B 3/00; G01N 29/00

U.S. Cl. 73—663 10 Claims



1. Vibration testing apparatus comprising a pivotally mounted vibration generator, a horizontal slip plate, a driver bar coupling said vibration generator to said horizontal slip plate, said driver bar having a central portion opposite the slip plate, an upper limb integral with said central portion and which extends over the upper side of said slip plate, and a separable lower limb which extends beneath the lower surface of said slip plate and which is in separable abutting relationship with said central portion of the driver bar, and means for securing said driver bar to said slip plate, including means enabling said lower limb of the driver bar to be separated from the remainder of the driver bar so as to enable said vibration generator and the remainder of said driver bar to be pivoted away from said slip plate without lateral displacement of the slip plate along its axis.

4,489,613

TRANSMITTING DEVICE FOR MEASURING THE OPERATING PRESSURE IN A SYSTEM

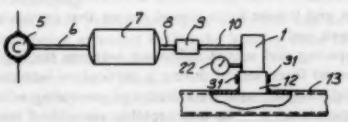
Ennio Valletti, Via Rosso Medardo, 16, 20159 - Milano, Italy

Filed Jan. 25, 1983, Ser. No. 460,947

Claims priority, application Italy, Feb. 10, 1982, 19559 A/82

Int. Cl.³ G01L 7/08

U.S. Cl. 73—701 4 Claims



1. A device for measuring pressure and pressure variations of a pressurized fluid flowing through a duct (13), which device comprises an upper body and a lower body, coupled to one another by means of locking screws, said lower body being tightly connected by means of a resilient ring member, with a sleeve member welded on said duct, the upper body being coupled to a pressurized air source through a threaded coupling member, a graduated scale duct, associated with said upper body and communicating with a needle valve, said valve allowing for the air inflow into said duct to be manually adjusted, a coupling duct leading to an interspace defined between said lower and upper bodies and communicating with a diaphragm associated with said lower body, a pressure detecting instrument coupled with said graduated scale duct.

4,489,614

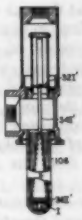
FLOWMETER

Robert J. deFasselle, Timberidge Trail, Gates Mills, Ohio 44040, and Craig R. deFasselle, 38411 Wood Rd., Willoughby, Ohio 44094

Continuation-in-part of Ser. No. 208,630, Nov. 20, 1980, Pat. No. 4,361,051. This application Nov. 29, 1982, Ser. No. 444,976

Int. Cl.³ G01F 1/22

U.S. Cl. 73—861.54 15 Claims



1. A flowmeter for measuring the flow rate of a fluid media comprising in combination:

a body portion including a fluid inlet and a fluid outlet;

a fluid path extending between said fluid inlet and said fluid outlet;

a core tube disposed vertically within said body portion;

a recessed groove defined by said core tube, said groove extending longitudinally relative to said core tube;

a first piston movably disposed within said core tube, said first piston being disposed adjacent to said recessed groove;

a cross-sectional area of said fluid path defined by said recessed groove and said first piston, said cross sectional area of said fluid path being variably dependent upon the longitudinal disposition of said first piston relative to said recessed groove;

a cover tube disposed adjacent said body portion and in fluid communication with said fluid path;

a second piston movably disposed within said cover tube;

connecting means for connecting said second piston to move in unison with said first piston;

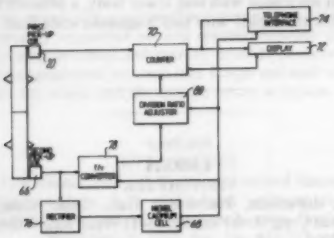
a first and a second side of said second piston, said second piston being immersed in a static liquid in said cover tube enabling said static liquid to be disposed on said first and said second sides of said second piston; and

an indicator means cooperating with said second piston for indicating the position thereof relative to said cover tube to indicate the fluid flow rate between said fluid inlet and said fluid outlet, said connecting means and said static liquid being related such that said indicator means is operative within a range dependent upon the buoyancy of said connecting means in said static liquid.

4,489,615
FLUID FLOW METER

Robert W. F. Ward, Bury St. Edmunds, England, assignor to Breckland Meters Limited, Mildenhall, England

Filed Jan. 4, 1983, Ser. No. 455,791
Int. Cl.[3] G01F 3/10, 15/06
U.S. Cl. 73—861.78 8 Claims

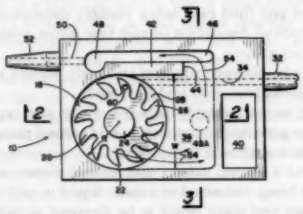


1. A fluid meter comprising:
(a) wall means defining a cavity;
(b) an inlet to the cavity and an outlet from the cavity;
(c) a rotor mounted within said cavity between said inlet and said outlet to rotate at a rate which is substantially proportional to flow of fluid through the meter;
(d) detectable means fixed in relation to said rotor;
(e) detector means capable of detecting said detectable means, arranged outside said cavity to provide a signal in dependence upon rotation of said rotor without being mechanically linked thereto;
(f) measuring means connected to said detector means to provide a measure of the volume of fluid which flows through the meter from the signal from the detector means;
(g) a flowrate indicator connected to said detector means to provide, from the signal therefrom, a signal indicative of the flowrate of fluid through the meter; and
(g) a calibration adjuster connected between said flowrate indicator and said measuring means to adjust the calibration of said measuring means in dependence upon the signal from said flowrate indicator.

4,489,616
DIGITAL FLUID FLOW METER

Jerry L. Priddy, 216 S. 162 E., Tulsa, Okla. 74108

Filed May 16, 1983, Ser. No. 494,899
Int. Cl.[3] G01F 1/06
U.S. Cl. 73—861.79 7 Claims

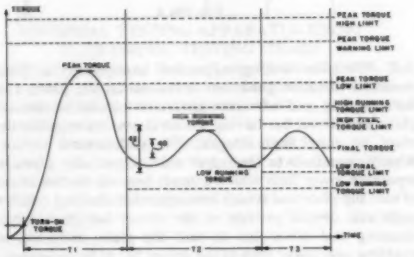


1. A fluid flow meter, comprising;
(a) a shallow block with first and second faces parallel to each other and separated by a thickness T, with a circular opening of selected radius R through said block; with axis perpendicular to said faces;
(b) a first entrance conduit longitudinally through said block approximately midway between said first and second faces, intersecting said circular opening approximately tangentially;
(c) a portion of said first face adjacent said circular opening depressed a depth D, forming a first channel of approximate width W, where W is slightly less than 2R, and depth D;
(d) second exit conduit means connected to said first channel;
(e) circular impeller means of radius slightly less than R in said circular opening, said impeller having a plurality of spaced substantially radial vanes, and having a first axial boss of length D extending from a first face, and a second axial boss extending from the second face of said impeller, the total thickness of impeller plus first and second bosses equal approximately to T, with said first face of said impeller approximately coplanar with said first channel; and
(f) means on said first and second faces to at least cover and seal all openings on said first and second surfaces.

4,489,617
QUALITY CONTROL METHOD

Stanley K. Smith, Fenton, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 14, 1982, Ser. No. 398,021
Int. Cl.[3] G01L 5/26
U.S. Cl. 73—862.19 22 Claims



6. A method of testing an assembly which is adapted to move in a predetermined motion though a cycle, comprising the steps of:
applying a controlled force to said assembly to move said assembly through a cycle,
dividing each cycle of said assembly into a plurality of increments,
sensing the force applied to said assembly during each increment of the cycle,
sensing the difference between the highest force and the lowest force sensed during a particular increment,
setting a differential force limit for a particular increment indicative of the permissible difference between the highest and lowest force sensed during that particular increment, and
comparing said sensed difference between the highest and lowest force sensed during a particulary increment with said set differential force limit and generating a first signal representative of an unacceptable assembly if said sensed differential force is not within the differential force limit,
said step of dividing each cycle of said assembly into a plurality of increments includes the steps of dividing a cycle of said assembly into a plurality of incremental movements or linear movements.

4,489,618

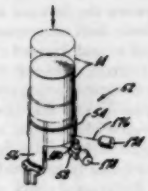
PIPET SIGNALLING SYSTEM

Richard C. Meyer, 1810 Stearns Ave., La Habra, Calif. 90631

Continuation of Ser. No. 165,907, Jul. 3, 1980, abandoned. This application Feb. 23, 1982, Ser. No. 351,569

Int. Cl.³ B01L 3/02

U.S. Cl. 73—864.16 2 Claims



1. For use in pipetting apparatus of the type comprising a generally tubular body having an open forward end for receiving and expelling fluid, a plunger supported for axial movement in the body to draw fluid into and dispense fluid from te body with axial movement away from and toward the open end during successive fluid pickup and fluid dispensing strokes of plunger movement, a signalling system for signalling occurrence of the fluid dispensing stroke comprising:

signalling means for responding to plunger positioning in a forward axial position for signalling the occurrence of such plunger positioning;

a disabling element movable between first and second locations in the body, the disabling element in the first location cooperating to inhibit response of the signalling means to said plunger positionings, the disabling element in the second location cooperating to allow response of the signalling means to said plunger positioning;

means for retaining the disabling element in the first location thereof; and

means responsive to plunger movement away from the forward end during a first plunger pickup stroke for moving the disabling means to the second location thereof whereby the signalling means is conditioned for detecting and signalling said plunger positioning during the succeeding second plunger dispensing stroke thereby signalling occurrence of the fluid dispensing stroke.

4,489,619

DEVICE FOR MEASURING CLAMPING FORCE

Josef Steinberger, Düsseldorf, Fed. Rep. of Germany, assignor to Paul Forkardt GmbH & Co. KG, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,045

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136286

Int. Cl.³ G01L 1/22

U.S. Cl. 73—862.65 5 Claims

1. A device for measuring the force occurring on radially inwardly movably guided clamping elements of clamping devices by means of a force pickup which is arranged in a housing, comprising

at least one force pickup having an inner end and an outer end and being arranged within the housing fixed in position in substantially radial alignment,

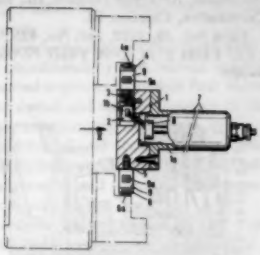
a replaceable pressure piece,

said force pickup resting at said inner end against the housing and having on said outer end a connection means for operatively connecting said replaceable pressure piece thereto,

at least one other pressure piece is operatively connectable to said housing at least at one other position of the housing other than the position of the force pickup,

adjusting resistors are arranged centrally in the housing and electrically connected with said force pickup,

said housing is formed with an axial bore, and



an extension is attached to said housing so as to close off said axial bore, said resistors being arranged within said axial bore.

4,489,620

DRIVE UNIT FOR A CLEANING DEVICE

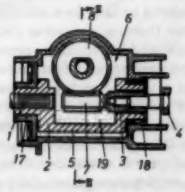
Hans-Peter Simm, Wuppertal, and Wieland Gühne, Remscheid, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,895

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045895

Int. Cl.³ F16H 21/18

U.S. Cl. 74—42 6 Claims



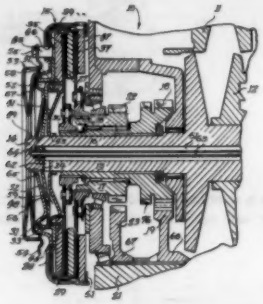
1. A drive unit for a cleaning device having a drive with a rotary shaft and a working tool, operative for translating a rotational movement of the rotary shaft into oscillating pivoting movement of the working tool, the drive unit comprising a shaft connectable to the working tool; an end member mounted on the rotary shaft of the drive; a drive element rigidly connected to said connectable shaft and arranged to coaxially surround said end member; and translation means connected to said end member and operative for translating the rotational movement of the rotary shaft to the oscillating pivoting movement of said drive element, said translation means including a worm connected to said end member and having an axis, a worm gear having an axis positioned at 90° relative to the axis of said worm, at least one eccentric rigidly connected to said worm gear, an elongated axle, said worm gear and said eccentric being arranged on said axle so that said eccentric rotates on said axle upon rotation of said worm gear, at least one transmission guide mounted on said eccentric, and slidable roller means operatively interconnected between said transmission guide and said drive element to translate the rotational movement of said eccentric into oscillating pivoting movement of said drive element.

4,489,621

DUAL WET OUTPUT CLUTCH FOR POWER SELECTION IN A CONTINUOUSLY VARIABLE TRANSMISSION

Arthur M. McIntosh, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 28, 1982, Ser. No. 425,734
Int. Cl.³ F16H *3/14, 3/08;* **F16D** *19/00, 21/08*
U.S. Cl. 74—355 **9 Claims**



2. In a continuously variable transmission having a driving shaft from the transmission, a forward gear set and a reverse gear set between the driving shaft and a driven shaft, and a forward-neutral-reverse selector to determine which gear set rotates the driven shaft, the improvement including a dual clutch assembly forming the forward-neutral-reverse selector, the dual clutch assembly including an intermediate pressure plate operatively connected to said driving shaft, a forward pressure plate on one side of said intermediate pressure plate and a reverse pressure plate on the opposite side thereof, each operatively connected to said driving shaft, a forward clutch plate positioned between the forward and intermediate pressure plates, a first sleeve shaft encompassing the driving shaft, operatively connected to said forward clutch plate and carrying a forward gear thereon, a reverse clutch plate positioned between the reverse and intermediate pressure plates, a second sleeve shaft encompassing said first sleeve shaft, operatively connected to said reverse clutch plate and carrying a reverse gear thereon, said reverse gear set including said reverse gear, a reverse gear mounted on said driven shaft for rotation therewith, and an idler gear on an idler gear shaft and meshed with said reverse gears, a source of hydraulic pressure to actuate the forward pressure plate axially toward the intermediate pressure plate to engage the forward clutch plate, a separate source of hydraulic pressure to independently actuate the reverse pressure plate axially toward the intermediate pressure plate to engage the reverse clutch plate, said separate sources of hydraulic pressure being alternately actuated so that only one gear set is actuated at any one time, and means to disengage the reverse gear set from the driven shaft when the forward clutch plate is engaged including an elongated bearing on said idler shaft for longitudinal movement of said idler gear, and means to shift said idler gear into and out of meshing engagement with said reverse gears.

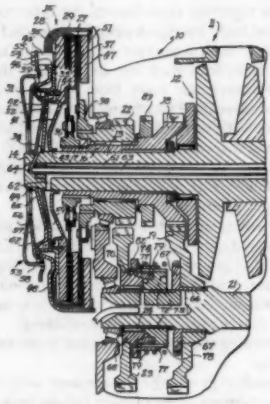
4,489,622

DUAL WET OUTPUT CLUTCH FOR POWER SELECTION IN A CONTINUOUSLY VARIABLE TRANSMISSION

Herbert N. Underwood, Chicago, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 28, 1982, Ser. No. 425,735
Int. Cl.³ F16H *3/14, 3/08;* **F16D** *19/00, 11/00*
U.S. Cl. 74—361 **8 Claims**

4. In a continuously variable transmission having a driving shaft from the transmission, a forward gear set and a reverse gear set between the driving shaft and a driven shaft, and a forward-neutal-reverse selector to determine which gear set rotates the driven shaft, the improvement comprising a dual clutch assembly forming the forward-neutral-reverse selector, the dual clutch assembly including an intermediate pressure plate operatively connected to said driving shaft, a forward pressure plate on one side of said intermediate pressure plate and a reverse pressure plate on the opposite side thereof, each operatively connected to said driving shaft, a forward clutch plate positioned between the forward and intermediate pressure plates, a first sleeve shaft encompassing the driving shaft, operatively connected to said forward clutch plate and carrying a forward gear thereon, a reverse clutch plate positioned between the reverse and intermediate pressure plates, a second sleeve shaft encompassing said first sleeve shaft, operatively connected to said reverse clutch plate and carrying a reverse gear thereon, a source of hydraulic pressure to actuate the forward pressure plate axially toward the intermediate pressure plate to engage the forward clutch plate, a separate source



of hydraulic pressure to independently actuate the reverse pressure plate axially toward the intermediate pressure plate to engage the reverse clutch plate, said separate sources of hydraulic pressure being alternately actuated so that only one gear set is actuated at any one time, said reverse gear set including said reverse gear on said second sleeve shaft and a reverse gear on a hub rotatably mounted on said driven shaft and operatively connected to the sleeve shaft reverse gear, said forward gear set including said forward gear on said first sleeve shaft in mesh with a forward gear operatively connected to said driven shaft, and means to positively deactivate the reverse clutch plate when the forward clutch plate is engaged to prevent drag losses therefrom including a rotatable hub on said driven shaft between said forward and reverse gears, said driven shaft having an external thread formed thereon, and said hub having a complementary meshing internal thread to provide axial motion of the hub upon relative rotation between the hub and driven shaft.

4,489,623

AXLE SHAFT AND PUMP DRIVE MECHANISM

Peter Hakkenberg, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 3, 1982, Ser. No. 373,825
Int. Cl.³ F16H *3/14;* **F16D** *21/04, 31/02;* **B60K** *17/28*
U.S. Cl. 74—378 **3 Claims**

1. An axle shaft and pump drive mechanism for a vehicle having an implement mounted thereon, comprising:

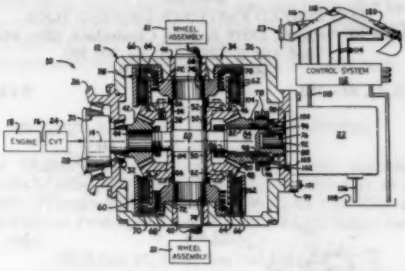
a continuously variable transmission unit;

an axle housing;

an axle shaft disposed within the axle housing;

a pump of the fixed displacement type adaptable to drive the implement and being mounted on the axle housing; and

coupling means for selectively connecting the continuously variable transmisstion unit drivingly to the axle shaft and propelling the vehicle through an infinitely variable speed



ratio range, or alternatively drivingly to the pump and operating the pump through an infinitely variable speed ratio range while disconnecting the axle shaft therefrom, the coupling means being disposed within the axle housing.

4,489,624

TRIAXIAL HINGE FOR ROBOTS, HANDLING APPARATUS AND THE LIKE

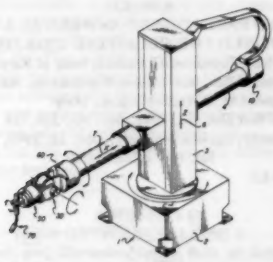
Albert Schaib, Ettishofen; Horst Manogg, Überlingen, and Adolf Hörl, Friedrichsafen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 362,646

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113184

Int. Cl.[3] **B25J** *3/04*

U.S. Cl. 74—479 **5 Claims**



1. A triaxial hinge for mechanical handling apparatus comprising first, second and third kinematic elements connected in series to provide, rotation about three axes intersecting at a single point, which three axes, in at least one operational position, are mutually perpendicular, each said element, when in said operating position, providing for said rotation about a different one of said axes,

said first element having a first hydromotor with a rotary output means directly supporting said second element and providing rotation of said second element about first of said axes,

said second element having parallel support carriers fixed to said first element and carrying a second hydromotor and being embraced by parallel rocker arms, said second hydromotor having rotary output means directly supporting said third element by means of said rocker arms, said support carriers and rocker arms being pivotally interconnected to enable the rotary output means of said second hydromotor to provide rotation of said third element about a second of said three axes,

said third element supporting a third hydromotor having a rotary output means to provide rotation about a third of said three axes,

said hydromotors being independently operable, their operation being coordinated by first, second and third synchro-drives mounted respectively to said first, second and third elements to detect and measure rotation of the respective hydromotor rotary output means,

said synchro-drive of said second element being disposed within said second hydromotor of said second element for direct operation by said rotary output means of said second hydromotor,

said synchro-drive of said third element being disposed within said third hydromotor of said third element for rotation by the rotary output of said third hydromotor.

4,489,625

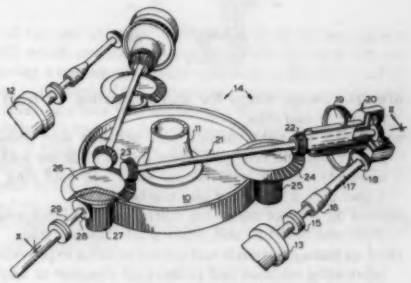
SPLIT TORQUE TRANSMISSION

Graham White, Chesterland, Ohio, assignor to Transmission Research, Inc., Cleveland, Ohio

Filed Nov. 23, 1982, Ser. No. 443,994

Int. Cl.[3] **F16H** *37/06*

U.S. Cl. 74—665 C **16 Claims**



1. in a helicopter having a main rotor drive shaft rotatable about a vertical axis and two parallel-mounted engines for powering said rotor drive shaft, a drive transmission for connecting said engines to said rotor drive shaft such that said engines are variably laterally separated from one another comprising:

respective input shafts driven by said engines, respective cross shafts connected to said input shafts at lead ends thereof and laterally angled relative to the longitudianl axis of said helicopter such that tail ends thereof are closer to said vertical axis than said lead ends,

respective drive pinion means powered from the tail ends of said cross shafts, and a combining gear secured to said rotor drive shaft and powered by said drive pinions spaced about the circumference thereof, the tail ends of said cross shafts being able to extend to said respective drive pinion means at various lateral angles for adjustment of the lateral separation of said engines.

4,489,626

LUBRICATION SYSTEM FOR A PLANETARY GEAR SYSTEM

Robert W. Lemon, Farmington Hills, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 13, 1982, Ser. No. 339,035

Int. Cl.[3] **F16H** *3/44;* **F01M** *9/00, 1/00*

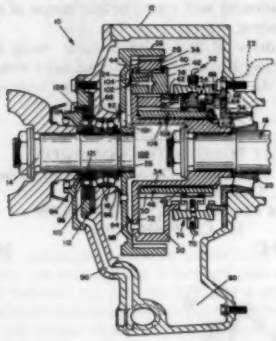
U.S. Cl. 74—781 R **8 Claims**

1. An improved lubrication system for a planetary gear system of the type which includes a housing having an input shaft and an output shaft rotatably mounted therein, ring gear

wheel means mounted on said input shaft and including a ring gear, a planetary carrier rigidly secured to said output shaft and having a plurality of planetary gears rotatably mounted thereon and in engaging contact with said ring gear, a sun gear engaging said plurality of planetary gears, and means for coupling said sun gear to said housing to cause reduced driving of said output shaft by said input shaft, said improvement comprising:

a source of lubricating oil in said housing;

oil pumping means driven by rotation of said input shaft and having an inlet and an outlet;



first oil passage means for said lubricating oil from said source to said inlet;

an annular oil tight running seal between said planetary carrier and said ring gear wheel means to define with said planetary carrier, said output shaft and said ring gear wheel means a primary oil chamber;

second oil passage means for delivering said lubricating oil from said outlet to said primary oil chamber; and

third oil passage means is said carrier housing to provide said lubricating oil from said primary oil chamber to said plurality of planetary gears.

4,489,627

RAZORS AND SHAVING UNITS FOR RAZORS

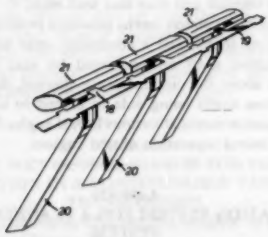
Max A. Lembke, Greenford, England, assignor to Wilkinson Sword Limited, England

Filed Jan. 25, 1982, Ser. No. 342,278

Claims priority, application United Kingdom, Jan. 21, 1981, 8101769

Int. Cl.³ B21K *11/00*

U.S. Cl. 76—104 R **4 Claims**



1. A process for the manufacture of razors or shaving units for razors, which comprises forming a strip of blade metal with at least two cutting edges, wherein the strip of blade metal is formed with a plurality of elongate aperatures extending along the strip, the blade edges being provided on portions of the strip which are separated from the remainder of the strip by webs extending between the aperatures, introducing the strip into a mold cavity and molding plastics material directly on to the strip to form the plastics portion of a razor or shaving unit on each cutting edge or on both cutting edges, the plastics portions being spaced apart, and cropping at least part of said webs to release the razors or shaving units from each other.

4,489,628

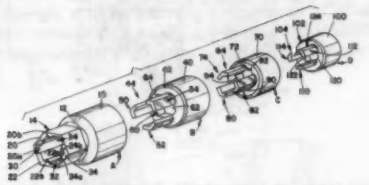
MULTISIZED FASTENER DRIVING TOOL

Hector M. Nicastro, 13019 Kenyon, Chesterland, Ohio 44026

Filed Aug. 5, 1982, Ser. No. 405,392

Int. Cl.³ B25B *13/58*

U.S. Cl. 81—185 **9 Claims**



1. A driving tool for driving any one of a plurality of preselected sized threaded fasteners, each fastener size having six driver engaging surfaces arranged in a hexagonal array and connected at six corners, the driving tool comprising:

a first socket having three circumferentially spaced first fastener engaging portions for engaging three of the six corners of a first sized fastener and defining three first guideways therebetween;

a second socket having three circumferentially spaced second fastener engaging portions for engaging three of the six corners of a second sized fastener, the second fastener engaging portions being slidably disposed in the first socket guideways; and,

connecting means for connecting the first and second sockets with means for applying a rotational torque.

4,489,629

BORING AND FACING HEAD AS WELL AS A MACHINE DESIGNED FOR RECEIVING THIS HEAD

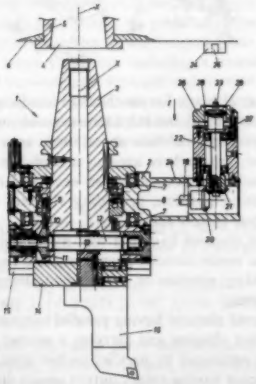
Nicola D'Andrea; Ermanno D'Andrea, both of Saronno; Castellini Adriano, Milan, and Medea Ferdinando, Saronno, all of Italy, assignors to D'Andrea S.p.A., Italy

Filed Dec. 14, 1981, Ser. No. 330,724

Claims priority, application Italy, Dec. 23, 1980, 26892 A/80

Int. Cl.³ B23B *29/03*

U.S. Cl. 82—1.2 **16 Claims**



1. A boring and facing head for use in a machine tool, the combination comprising:

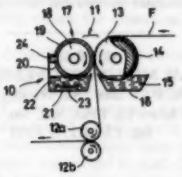
a body adapted to be inserted into a spindle on the machine tool;
a tool;
first means, coupled to said body and said tool, for supporting said tool for movement transversely of said body; and
second means, coupled to said first means and slidably engageable with a rotation device supported by the machine tool whose rotary movement is precision-controlled by a numerical control unit, for moving said tool transversely of said body in a precision-controlled manner,
said second means being laterally spaced from said body.

4,489,630

METHOD AND APPARATUS FOR SLITTING THERMOPLASTIC FILMS

Tokio Okada; Shigezo Kojima; Haruhisa Tani; Kazuhiko Kurihara, all of Tokyo, and Hirosi Yazawa, Kunitachi, all of Japan, assignors to Nippon Petrochemicals Co Ltd., Chiyoda and Polymer Processing Research Institute Ltd., Tokyo, both of, Japan

Filed Sep. 17, 1982, Ser. No. 419,563
Claims priority, application Japan, Sep. 21, 1981, 56-148967
Int. Cl.³ B26F *3/10*; B26D *7/10*
U.S. Cl. 83—15 **27 Claims**



1. A method of slitting a continuous thermoplastic film, comprising the steps of:
(a) advancing the film longitudinally at a first speed along a peripheral surface of a roll rotating at a circumferential speed substantially equal to or slightly greater than said first speed, said peripheral surface comprising an elastic layer made of a polymeric material;
(b) slitting the film while being advanced by pressing, against said elastic surface layer, cutting edges of a cutter rotating at substantially the same speed as said roll;
(c) heating said cutting edges above a temperature at which the thermoplastic film starts melting; and
(d) cooling the film and said elastic surface layer of said roll along their interface.

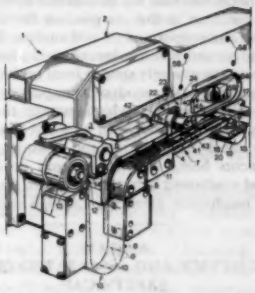
4,489,631

FEED DEVICE FOR LABELS

Enzo Seragnoli, and Riccardo Mattei, both of Bologna, Italy, assignors to G. D Societa' per Azioni, Bologna, Italy

Filed Dec. 9, 1982, Ser. No. 448,218
Claims priority, application Italy, Dec. 22, 1981, 3614 A/81
Int. Cl.³ B65H *17/40*
U.S. Cl. 83—278 **5 Claims**

1. A device for feeding labels, in particular country stamps or sealing strips, to a utiliser machine, in particular a cigarette packaging machine, characterisrd by the fact that it comprises, in combination, a support body (2), an advancement track (7) for a continuous strip (8) of labels (9) extending along the said support body (2) and including an input portion (4) and an output portion (17) aligned with one another and together defining a separating slot (18), a slide (24) mounted on the said support body in a position adjacent the said track and movable with a reciprocating movement along it, an advancement device (40) carried by the said slide (24) and operable to cooperate with the said strip (8) to cause advancement thereof along the input portion (4) of the said track (7), a hollow shaft (53) carried rotatably by the slide (24) and operable to turn with a reciprocating movement about its axis in a determined phase relation with the movement of the said slide (24), a cutting element (20) supported by the said support body (2) in a position adjacent the said slot (18) and rotatable about its axis with a determined phase relation with the movement of the said slide (24);
the support body (2) having means to selectively and separately support thereon at one time either one of two interchangeable auxiliary units (60, 61) having means connectable to the said means on the support body (2) in a position facing the said slot (18);



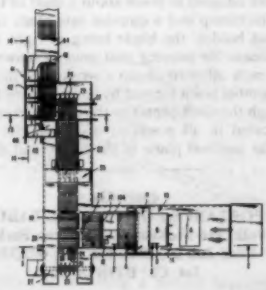
one of the said units (61) including a fixed cutting element (67) which can be disposed facing the said slot (18) and having a cutting edge tangential both to the said track (7) and to the path of the said rotary cutting element (20); and
the other said unit (60) including a fixed magazine (62) for labels (9) which can be positioned facing the said slot (18) and a rotary extractor element (65) for the said labels keyed on the said hollow shaft (53) and movable with this latter in the space between one end of the magazine (62) and the said track (7); the said extractor element (65) being connectable to a suction device by means of the said hollow shaft (53).

4,489,632

WAFFLE SANDWICH SAWING MACHINE

Robert J. Albrecht, River Edge; Daniel Ignatuk, Morris Plains, both of N.J.; Albert A. Pinto, White Plains, N.Y., and William J. Simelunas, Glen Rock, N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jul. 26, 1982, Ser. No. 402,167
Int. Cl.³ B26D *1/11*, *11/00*
U.S. Cl. 83—404.2 **16 Claims**



1. Apparatus for sawing a stack of large baked sheets into a multitude of pieces arranged in package-sized groups comprising in combination: an elongated product supporting surface having input and output ends; a first saw mechanism positioned between said ends of said surface including a row of reciprocating saw blades extending through said surface; pusher

means moveable to engage the product and slide it along said surface through said saw blades and off the output end of said surface; product transporting means positioned at the end of said surface for receiving and engaging the cut product to move the cut product in the direction perpendicular to the cut lines therein; and a second saw mechanism including a row of reciprocating saw blades extending across the path of the product carried by said transporting means to cut the product perpendicular to the first cut lines, said product transporting means including a longitudinally slotted conveyor comprising a plurality of longitudinally extending endless product-supporting members mounted for motion in a direction perpendicular to the cut lines in the cut product for carrying the cut product from the output end of said surface through the saw blades of said second saw mechanism, said product-supporting members being transversely spaced from each other to provide slots therebetween, said product transporting means further including pusher elements which engage the edges of the stacked sheets and pass between adjacent saw blades of said second saw mechanism during the sawing operations, said pusher elements being attached to said product-supporting members and positioned between said slots, said blades of said second saw mechansim extending through said slots.

4,489,633

SAWING DEVICE AND ASSOCIATED CLAMP AND SAFETY CAP

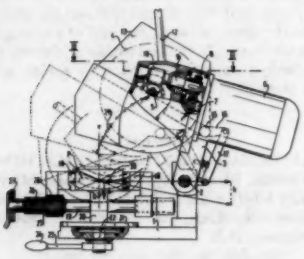
Cornelis A. M. van de Wouw, Berkel-Enschot, Netherlands, assignor to Machinefabriek Bewo B.V., Tilburg, Netherlands

Filed Sep. 23, 1981, Ser. No. 304,654

Claims priority, application Netherlands, Nov. 10, 1980, 8006124

Int. Cl.³ B23D *47/04, 47/08*

U.S. Cl. 83—464 **7 Claims**



1. A sawing device mainly comprising a frame, a clamp for the product to be sawn provided with mutually displaceable jaws, a holder adapted to pivot about a shaft of the frame with respect to the clamp and a circular saw blade rotatably journalled in said holder, the blade being at right angles to said shaft, and means for moving said jaws in unison toward and away from each other to clamp a workpiece therebetween so that the tangential point formed by an imaginary tangential line going through the shaft centre to the circumference of the saw blade is located in all positions of the holder between the perpendicular medium plane of the clamp and the shaft.

4,489,634

PORTABLE POWER TOOL TABLE

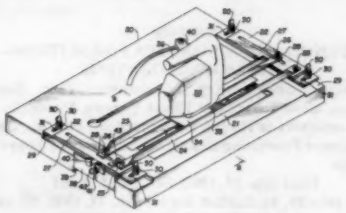
Michael J. Volk, 216 McKeon Rd., Severna Park, Md. 21146

Filed Jul. 28, 1982, Ser. No. 402,739

Int. Cl.³ B27B *21/00*

U.S. Cl. 83—522 **12 Claims**

1. A table for portable power tools comprising a table body portion having a workpiece support surface, a guide rail assembly comprising end mounting members and a pair of guide rails for the support and guidance of power tools, at least one guide rail being laterally adjustable relative to the other guide rail, means on the table body portion near opposite ends thereof and adjacent to said mounting members to, in one mode of use of the table, floatingly support the mounting members and the guide rail assembly for unrestrained vertical movement while restraining the mounting members and guide rail assembly against lateral and longitudinal movement relative to the workpiece support surface, support surfaces on said means on the table body portion at a fixed elevation above the workpiece support surface, and in a second mode of use of the table, said mounting members engaging said support surfaces on said means on the table body portion to support said mounting members, and guide rail assembly at a fixed elevation above the



workpiece support surface restraining the mounting members and guide rail assembly from vertical movement and against lateral and longitudinal movement relative to the workpiece support surface.

4,489,635

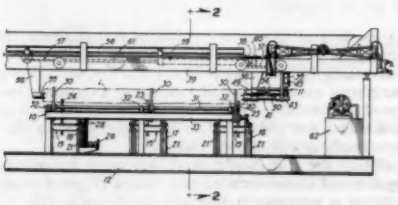
SAW MILL IMPROVEMENTS

William B. Cooper, P.O. Box 550, Wadley, Ga. 30477

Filed Mar. 16, 1983, Ser. No. 475,930

Int. Cl.³ B27B *7/00*

U.S. Cl. 83—708 **15 Claims**

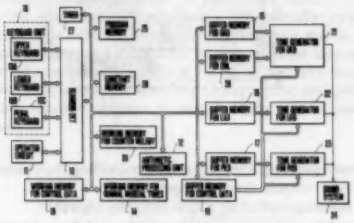


1. In a saw mill for the production of square cross section timber pieces from rough logs, a log orientation mechanism comprising at least a pair of spaced orientation units each having laterally spaced rotatable log engaging and supporting parallel axis discs, the discs of one orientation unit having rough peripheries adapted to drive a supported log in rotation on its longitudinal axis, power drive means for the discs having the roughened peripheries, power means to independently raise and lower the discs of said orientation units, and a cooperative log dogging, indexing and stabilizing mechanism comprising a pair of spaced units having transport carriages guidingly engaged with overhead support rails for the carriages, and power means connected between the carriages to move the carriages toward and from the opposite end faces of a log resting on said orientation mechanism, a log supporting and indexing dog on one unit of the second-named mechanism, power means on such unit connected with the supporting and indexing dog to index such dog precisely 90° between fixed limit stops, a stabilizing dog on said one unit above the supporting and indexing dog, power means on such unit to move the stabilizing dog on a linear path toward and from engagement with a log end face while precluding rotation of said stabilizing dog, and the second-named mechanism including a second unit spaced from the first unit of said dogging, indexing and stabilizing mechanism and having a freely rotatable log end face engaging dog coaxially aligned with the indexing dog.

4,489,636
ELECTRONIC MUSICAL INSTRUMENTS HAVING SUPPLEMENTAL TONE GENERATING FUNCTION

Eiichiro Aoki, and Iwao Higashi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 11, 1983, Ser. No. 493,711
Claims priority, application Japan, May 27, 1982, 57-88746; May 27, 1982, 57-88747
Int. Cl.³ G10H *1/38, 7/00*
U.S. Cl. 84—1.01 **16 Claims**

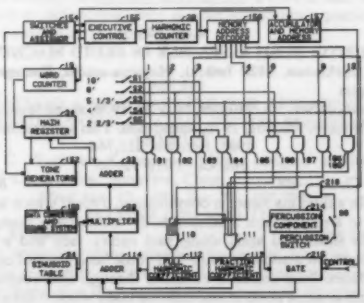


1. An electronic musical instrument comprising:
chord designating means for designating a chord;
chord type detecting means for detecting a chord type of said chord;
chord designation detecting means for detecting the fact that said chord has been designated;
tone selecting means for selecting, in response to the detection of said fact, one from among a group of tones in priority order determined by said chord type, said group comprising the chord constituting tones of said chord; and
tone producing means connected to said chord designating means and said tone selecting means for producing a chord tone and a supplemental tone corresponding to said chord and said selected tone respectively.

4,489,637
PERCUSSIVE VOICE GENERATOR FOR AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instruments Mfg. Co., Ltd, Hamamatsu, Japan

Filed Sep. 24, 1982, Ser. No. 422,809
Int. Cl.³ G10H *1/06*
U.S. Cl. 84—1.22 **11 Claims**

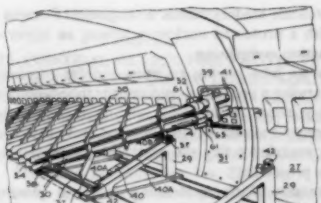


1. In a keyboard musical instrument having a keyboard containing a plurality of keyswitches and having a number of tone generators, in which a plurality of data words corresponding to the amplitudes of points defining the waveform of a musical tone are computed and transferred sequentially to a digital-to-analog converter to be converted into musical waveshapes, apparatus for producing a transient percussive voice in combination with a preselected musical tone comprising;
a plurality of tone switches,
a coefficient memory means for storing a set of harmonic coefficient values,
a percussion memory for storing a percussion harmonic coefficient value,
a harmonic number generating means whereby a consecutive sequence of harmonic numbers is generated,
a first address decoder means responsive to said sequence of harmonic numbers whereby a subsequence of harmonic signals is generated by selecting prespecified ones of said sequence of harmonic signals and wherein said subsequence of harmonic signals is less in number than said sequence of consecutive harmonic numbers,
a coefficient select means responsive to the actuation of said plurality of tone switches and responsive to said subsequence of harmonic signals whereby selected harmonic coefficient values from said set of harmonic coefficient values are read out from said coefficient memory means to provide a sequence of selected harmonic coefficient values,
a percussion means responsive to a percussion control signal whereby said percussion harmonic coefficient value is read out from said percussion memory in response to a preselected one of said sequence of harmonic signals,
an adder means for combining said read out percussion harmonic coefficient value with said sequence of selected harmonic coefficient values to provide a combination sequence of harmonic coefficient values,
a main memory means,
a means for computing, responsive to said combination sequence of harmonic coefficient values, whereby said plurality of data words corresponding to the amplitudes of points defining a waveform for a period of a musical tone are computed and stored in said main memory means, and
a means for producing musical waveshapes from said plurality of data words stored in said main memory means thereby producing said transient percussive voice in combination with a preselected musical tone.

4,489,638
QUICK CONVERSION MISSILE SYSTEM FOR WIDEBODY AIRCRAFT

Thomas W. Bastian, Fullerton, and Charles W. Schertz, Claremont, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Mar. 14, 1983, Ser. No. 474,994
Int. Cl.³ F41F *3/06*
U.S. Cl. 89—1.815 **30 Claims**



23. The method of installing a missile launching system within the passenger compartment of a standard commercial aircraft without the necessity of modifying the aircraft's structure comprising the steps of:
removing the passenger seats from the aircraft;
placing all of the components making up the system on

board the aircraft through a pre-existing passenger door opening;

assembling a frame arrangement by mounting individual frame members to the tracks provided for anchoring the passenger seats;

installing in bearing elements mounted on the individual frame members a plurality of track members for longitudinal movement relative to the aircraft;

placing a plurality of launch tubes in launch tube mounting members in position on the track members to form a rigid array movable therewith; and

installing a prefabricated bulkhead in a pre-existing fuselage opening, the bulkhead having means defining an exit port, a valve controlling a passageway accessing the exit port and a slidable coupling member for sealing the passageway from the exit port to an adjacent launch tube.

4,489,639

ARMOR CAR-MOUNTED MORTAR

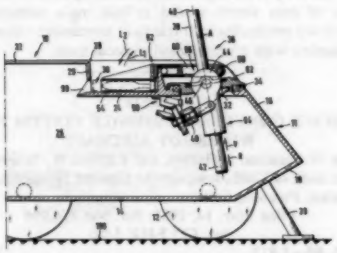
Gert Winkler, Meerbusch; Wilfried Becker, Düsseldorf; Erich Zielinski, Haan, and Herbert Lipp, Düsseldorf, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 3, 1982, Ser. No. 385,006

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3121963

Int. Cl.³ F41F *1/06*

U.S. Cl. 89—46 **16 Claims**



1. A muzzle loading mortar arrangement forming a combination with a protected enclosure having an upper cover, said combination comprising:

a mortar tube having an open end for receiving and discharging a projectile, said mortar tube having a bore axis;

loading means mounted for relative movement between the open end of said mortar tube and said protected enclosure for muzzle loading the open end of said mortar tube with the projectile;

a rotatable platform defining a lateral plane and being mounted in said upper cover; and

a cradle roll connected to and enclosing said mortar tube, said cradle roll including a recoil-return means for reducing the forces introduced into said protected enclosure during development of a shot from said mortar tube, said cradle roll being mounted in said rotatable platform so that the mortar tube passes through said rotatable platform and is pivotable, along with said cradle roll, about a horizontal axis which extends in close proximity to the lateral plane of said rotatable platform.

4,489,640

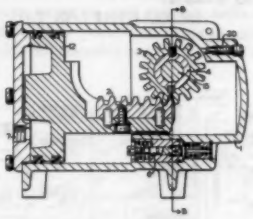
DOOR OPERATING APPARATUS

Paul E. Olson, Lexington, Ky., assignor to American Standard Inc., Lexington, Ky.

Filed Feb. 28, 1983, Ser. No. 470,415

Int. Cl.³ F01L *15/20*

U.S. Cl. 91—189 R **8 Claims**



1. Door operating apparatus, for controlling the opening and closing of a vehicle door, comprising:

(a) a housing including a first cylinder chamber,

(b) a piston and rack assembly within said first chamber and movable in both directions therein,

(c) a pinion and associated shaft coupled for moving said door and controlled by said piston and rack assembly for rotating in opposite directions to close and open said door as said rack moves in one or the other direction, respectively,

(d) means for supplying a source of pressurized fluid coupled to said first chamber for selectively moving said piston and rack assembly in said one and other directions,

(e) an auxiliary housing with a cylinder chamber coupled to said housing,

(f) a lift piston and rod assembly having the piston portion positioned within said auxiliary housing cylinder chamber to respond to pressurized fluid,

(1) the rod portion colocated within said pinion shaft, movable longitudinally with respect thereto, and coupled to said door,

(g) valve means coupling said auxiliary cylinder to said source and controlled by said piston and rack assembly for supplying pressurized fluid to said auxiliary cylinder chamber when said piston and rack assembly completes a full stroke when closing said door, and

(h) said lift piston and rod responsive to the pressurized fluid supplied to said auxiliary cylinder chamber for raising said rod and said door into a lock position.

4,489,641

ROTOR BUSH ASSEMBLY IN FLUID MACHINES

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Division of Ser. No. 910,809, May 30, 1978, abandoned, and Ser. No. 911,246, May 31, 1978, abandoned. This application Feb. 9, 1981, Ser. No. 232,746

Int. Cl.³ F01B *13/06*

U.S. Cl. 91—498 **6 Claims**

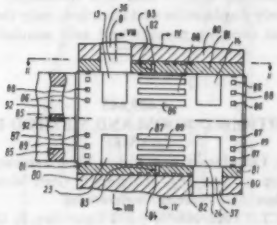
1. In a fluid machine, in combination, a rotor which is associated to a rotary face, a control body which has a control face which slides and seals along said rotary face and a sealing arrangement associated with said rotor, said control body and said faces; fluid conduits extended through said control body to form control ports in said control body while rotor channels which are capable and suitably located to communicate with said control ports periodically when said rotor revolves extend from said rotor face individually through at least a portion of said rotor to port into the respective periodically expanding and reducing working chambers in said rotor, whereby fluid can flow through one of said conduits and control ports and at least one of said rotor channels into at least one of said working

chambers and out of the respective at least one working chamber through at least one of said rotor channels, said control ports and said conduits, while said sealing arrangement includes means for sealing along said rotor face and said control face,

wherein

said rotor has a concentrically located bore which forms a rotor hub which extends axially in said rotor through at least the major length of said rotor, whereby the wall of said hub forms a holding seat of at least partially cylindrical configuration, wherein said control body is a substantially cylindrical control body of a diameter only slightly smaller than the diameter of said rotary face,

wherein said control body has a substantially cylindrical outer face which forms said control face and a bush is inserted into said rotor hub, having an inner face of cylindrical configuration, which forms said rotary face while said bush also has a seat face closely fitted and prevented from relative rotation in said holding seat of said rotor hub,



wherein said control body extends into said bush in said rotor to face said rotary face by said control face, whereby a small clearance is provided between said rotary face and said control face,

wherein said sealing arrangement consists therein, that said rotary face of said bush which revolves with said rotor receives and seals said control face of said control body, passages are provided in said outer face of said bush, closed by said holding seat outwardly and extending half way around said bush to end in diametrically opposite located places in said bush while radial bores extend from said places radially inwardly through said bush to meet respective portions of said control body; and

wherein said passages are individual passages starting individually from a respective chamber of said working chambers ending individually in a respective bore of said radial bores to individually face at least temporary a portion of said sealing arrangement.

4,489,642

METHOD AND APPARATUS FOR REDUCING OPERATING NOISE IN AXIAL PISTON PUMPS AND MOTORS

Robert C. Westveer, Kalamazoo, Mich., assignor to General Signal Corporation, Stamford, Conn.

Filed Jan. 13, 1983, Ser. No. 457,794

Int. Cl.³ F04B *1/20*; F01B *13/06*

U.S. Cl. 91—499 **21 Claims**

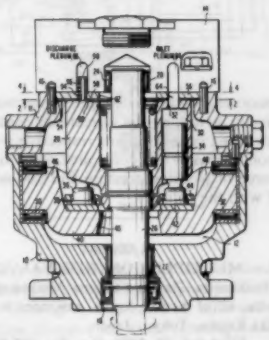
1. An improved valve member for use in an axial piston hydraulic apparatus of the type including a housing having an interior chamber; a shaft extending through said chamber and mounted for rotation in said housing; a cylinder block mounted for rotation with said shaft and provided with a plurality of axially extending through cylinders having cylinder ports at one end of said block; a plurality of piston assemblies, one positioned for movement in each of said cylinders; cam means mounted to said housing and operatively connected to said piston assemblies at the other end of said block, for causing said piston assemblies to reciprocate in said cylinders when said block rotates with said shaft; an inlet plenum in said housing; and a discharge plenum in said housing, said valve member being fixed in operation between said block and said inlet and discharge plenums for controlling the flow of hydraulic liquid from said inlet plenum to said cylinders and from said cylinders to said discharge plenum, said valve member comprising:

a plate-like element having a thickness and an axis extending from a first point at which each of said pistons reaches the end of its inlet stroke to a second point at which each of said pistons reaches the end of its discharge stroke;

at least one inlet port extending through said element on the inlet side of said axis;

at least one discharge port extending through said element on the discharge side of said axis; and

pressure attenuation means, extended through said element



and positioned on the discharge side of said axis between said at least one discharge port and said first point, for providing an elongated flow path through the thickness of said element to convey hydraulic fluid between sequential trailing ones of said cylinders and said discharge plenum, flow through said elongated flow path being in parallel with flow from sequential leading ones of said cylinders through said at least one discharge port to said discharge plenum, said flow path having a length and a cross-section sufficient to permit gradual attenuation of a pressure differential between each said trailing cylinder and said discharge plenum, said gradual attenuation occurring before the cylinder port of each said trailing cylinder opens to said at least one discharge port of said element, whereby the operating noise level of said axial piston apparatus is reduced.

4,489,643

SAFETY CONTROL DEVICE FOR PROTECTING HYDRAULICALLY SUPPORTED LOADS AGAINST UNCONTROLLED LOWERING AND LIFTING

Harry Spielvogel, Dusseldorf, and Heinz Schedler, Heidesheim, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 21, 1981, Ser. No. 226,737

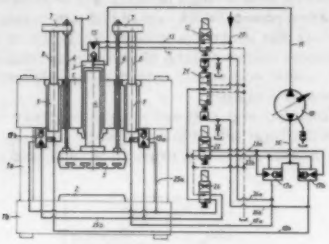
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1980, 3008929

Int. Cl.³ F15B *13/042*

U.S. Cl. 91—515 **9 Claims**

1. A safety control device for preventing uncontrolled movement of a load-supporting hydraulic cylinder, comprising: a source of working pressure; two working pressure supply pipes connecting said source of working pressure to said cylinder; two controlled non-return valves in each working pressure supply pipe, one of said valves in each pipe being associated with said cylinder and the other valve in each pipe being closer to said source; a pressure difference sensor opera-

tively connected to said supply pipes to indirectly control said valves to close said valves is response to a pressure difference between said supply pipes; a directional control valve which is electrohydraulically maintained in its rest position and which is controlled in a pressure difference dependent manner by means



of said sensor; and two branch pipes connected to said sensor for electrically switching the directional control valve, each branch pipe being connected to a respective working pressure pipe at a point between said controlled non-return valve closer to said source of working pressure and said non-return valve associated with the cylinder.

4,489,644

MULTIPLE CONTROL VALVES

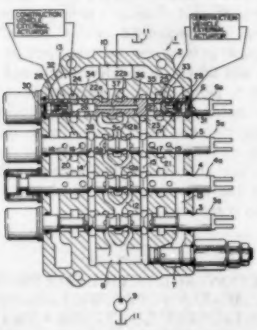
Toshiaki Tsukimoto, Zama; Chiharu Matsunaga, and Yutaka Hashimoto, all of Ayase, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1982, Ser. No. 402,854

Claims priority, application Japan, Aug. 6, 1981, 56-117256; Aug. 6, 1981, 56-117257

Int. Cl.³ F15B *13/08*

U.S. Cl. 91—530 **3 Claims**



1. In a multiple control valve for operating a construction vehicle and the like of the type comprising a valve body provided with at least two parallel holes for receiving direction change-over plungers, by-pass passage means arranged at a central portion of said valve body in a direction perpendicular to said holes and operatively connected to said plungers for feeding fluid from an external source to said plungers, fluid supply passage means arranged parallelly with said by-pass passage means for supplying fluid from said source to said plungers, said supply passage means being provided with an annular chamber at its endmost portion operatively communicated with one of said plungers arranged at the most downstream side of the multiple control valve, return passage means operatively connecting said fluid source to external actuators of the construction vehicle, and cylinder ports operatively connecting corresponding plunger holes to corresponding actuators, each of said plungers being provided with inner passages arranged on both sides thereof, said inner passages being operatively connected to corresponding ones of said cylinder ports through axial holes provided for said plunger, the improvement in which said one of the plungers disposed at the most downstream side of the multiple control valve comprises passage means crossing said one plunger and having opened ends, axial passage means having one end closed and the other end opened towards one of said inner passages, and a lateral port communicated with said one of inner passages, said crossing passage being communicated with said axial passage means at a portion near said closed end thereof, and in which when only said plunger disposed at the most downstream side is displaced from the neutral position in a direction to operate corresponding one of said actuators in one predetermined direction, said crossing passage communicates with said annular chamber of said supply passage and said lateral port communicates with said central by-pass passage, and when said most downstream plunger and another one of said plungers disposed upstream side of said first mentioned plunger are simultaneously displaced in said direction, only the connection between said crossing passage and said annular chamber is established.

4,489,645

AIR CONDITIONED ROOM AND METHOD FOR USING SAME

Edgar Sirch, Leverkusen, and Jürgen Vicariesmann, Unna, both of Fed. Rep. of Germany, assignors to Glatt Maschinen - und Apparatebau AG, Prattela, Switzerland

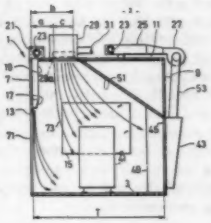
PCT No. PCT/CH82/00035, § 371 Date Nov. 5, 1982, § 102(e) Date Nov. 5, 1982, PCT Pub. No. WO82/03114, PCT Pub. Date Sep. 16, 1982

PCT Filed Mar. 5, 1982, Ser. No. 441,524

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1981, 3108678

Int. Cl.³ F24F *9/00*

U.S. Cl. 98—36 **20 Claims**



1. A clean room chamber comprising:

a. a housing with a rear wall, two side walls, a front wall defining an entrance opening opposite said rear wall, and a ceiling;

b. air curtain means defining an air outlet for providing a downwardly directed air curtain at said entrance opening;

c. air supply means positioned above said entrance opening between said front wall and said rear wall and nearer to the front wall and including an air outlet opening into the interior of the chamber for supplying air to the interior of said chamber;

d. exhaust means forming a suction surface extending over at least a part of said rear wall;

e. pump means connected with and for supplying air to said air curtain means and to said air supplying means;

f. filter means positioned upstream of said outlet of said air curtain means and upstream of said outlet of said air supply means;

g. said air outlet of said air supply means being pivotable in

relation to a horizontal axis substantially parallel to said front wall of said housing so that said air outlet can be positioned for producing a substantially turbulence-free, dust displacing air current directed downwardly and rearwardly toward said suction surface.

4,489,646

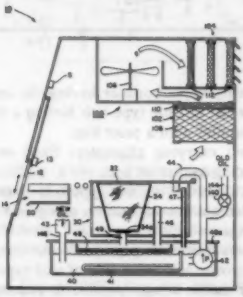
AUTOMATIC FRENCH FRYING MACHINE

Dieter Schmidt; Josef Buschor, both of Santa Clara County, Calif., and Wayne K. Spillner, Benton County, Wash., assignors to UI Group, Inc., Tri-Cities, Wash.

Division of Ser. No. 464,207, Feb. 7, 1983, Pat. No. 4,457,947. This application Jul. 15, 1983, Ser. No. 514,191

Int. Cl.³ A47J 37/12

U.S. Cl. 99—330 **20 Claims**



1. A cooking machine for handling food stored in a cartridge, the machine having a cooking vat, a basket for holding the food in the vat, hot oil in the vat for cooking the food, and a mechanism for removing the basket from the vat, characterized by:

the cartridge having a sealed removable cover, the cartridge holding an individual-sized portion of food product during packing, storing, transporting, handling in the cooking machine and finally serving;

said machine including a receptacle for holding an open cartridge inserted by the user into the machine, means for automatically dumping the food out of the cartridge into the basket for cooking, means for automatically dumping the cooked food out of the basket back into the cartridge, and means for signalling when the cooked food is returned to the cartridge for removal of the cartridge by the user;

said machine having a housing including an access opening closed by a door, said receptacle having a cartridge receiving position adjacent said access opening, said means for dumping food product out of said basket including means for inverting the basket over the receptacle when in the cartridge receiving position;

said means for dumping food into said basket including means for inverting the receptacle over the basket while the basket is within said cooking vat;

the means for inverting the basket additionally including means for rocking the frying basket back and forth to dislodge food adhering to the frying basket.

4,489,647

FOOD FRYING AND DISPENSING APPARATUS

Kenneth H. Stamps, 1825 Glouchester, Garland, Tex. 75040, and Clifford A. Watson, 2822 Glenbrook, Garland, Tex. 75041

Continuation-in-part of Ser. No. 372,970, Apr. 29, 1982, abandoned. This application Sep. 9, 1983, Ser. No. 530,014

Int. Cl.³ A47J 37/12

U.S. Cl. 99—336 **29 Claims**

1. Apparatus for cooking and dispensing various food products, said apparatus comprising:

a container for holding a supply of cooking oil;

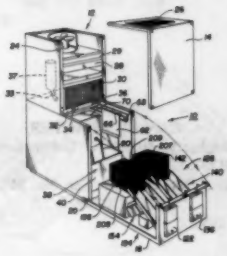
means for maintaining the temperature of said cooking oil sufficiently high for cooking successive batches of food products;

means for supporting the food product in the cooking oil during the cooking thereof;

means for depositing the food product into said supporting means by a consumer;

means for discharging the food product from said supporting means;

blower means for circulating air through the apparatus along a predetermined path and exiting at a predetermined location; and



a charcoal filter positioned in said predetermined air path, said charcoal filter comprising an upper portion of serpentine shape forming a succession of hills and valleys, a lower portion of serpentine shape forming a succession of hills and valleys, said lower portion being positioned in mating relationship with said upper portion and a predetermined distance therefrom, side portions operatively connected between said upper portion and said lower portion, around the periphery thereof, to form a volume therewithin, and charcoal particles contained within said volume.

4,489,648

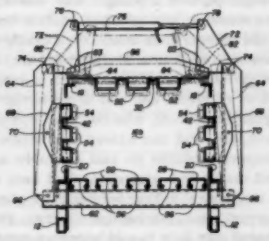
BALER DENSITY CONTROL MECHANISM

Adrianus Naaktgeboren, Veldegem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Jan. 18, 1984, Ser. No. 571,772

Int. Cl.³ B30B 9/30

U.S. Cl. 100—191 **9 Claims**



1. In a baler having a bale case with a top rail, a pair of side rails, and a bottom rail, control means for changing the positions of said top rail and said side rails, said control means comprising:

(a) a bottom member located adjacent said bottom rail;

(b) side members pivotally connected at their lower ends to said bottom member and pivotally connected intermediate their upper and lower ends to said side rails;

(c) a top member located adjacent and connected to said top rail;

(d) lever members pivotally connected to the upper ends of said side members and engaging said top member; and

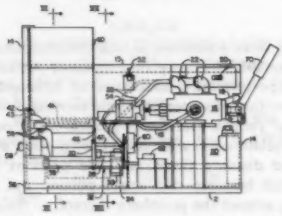
(e) power means connected between said lever members to move said lever members toward each other thereby causing said side members to be pivoted toward each other and also simultaneously causing said top member to be moved toward said bottom member.

4,489,649

CAN COMPACTER

Donald H. Daugherty, 10325 N. Government Way, Hayden Lake, Id. 83835

Filed Oct. 31, 1983, Ser. No. 547,127
Int. Cl.³ B30B 9/32
U.S. Cl. 100—215 5 Claims



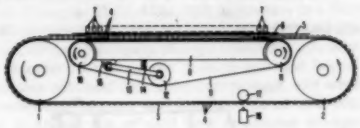
1. A can compacter assembly comprising a motor, a fluid pump operatively connected to said motor and adapted to be driven by said motor, a frame member, a stationary platen mounted on said frame member, a fluid control valve mounted on said frame member and in communication with said fluid pump, a fluid cylinder mounted on said frame member and in operative communication with said control valve, a piston movably disposed in said cylinder, a stem extending from said piston and through one end of said cylinder and having at its free end a plunger portion, a plunger slide assembly mounted on said frame member, said plunger portion being slidably disposed on said plunger slide assembly, a cradle mounted on said frame member and disposed adjacent to and in alignment with said plunger slide assembly and said platen, said cradle being adapted to receive a can and being further adapted to receive said plunger portion, whereby said plunger portion is adapted to compress said can against said platen is compact said can, a hopper mounted on said assembly and disposed proximate said cradle and adapted to feed cans serially into said cradle, a mechanical linkage between said plunger portion and said hopper, said mechanical linkage comprising a hingedly mounted trap door in said hopper, a rotatable spring-biased wheel proximate said hopper, a pin fixed to said wheel and having a distal end connected to said trap door, a protuberance extending from said wheel, and a dog extending from said plunger portion and adapted to engage said protuberance during a compressive stroke of said plunger portion, said engagement causing rotative movement of said wheel against said spring bias to cause said distal end of said pin to move said trap door hingedly to an open position, thereby permitting movement of a can from said hopper toward said cradle.

4,489,650

TYPE BELT PRINTER WITH ANTIFRICTION MEANS

Werner Hasler, Schoenaich; Subramaniam Padmanabhan, Herrenberg, and Klaus Staudenmaier, Gechingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 885,058, Mar. 9, 1978, abandoned. This application Mar. 6, 1980, Ser. No. 127,614
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1977, 2712998
Int. Cl.³ B41J 1/20
U.S. Cl. 101—93.14 10 Claims



1. An on-the-fly impact printer having the combination of

a continuous flat flexible type belt having a straight section running parallel with a print line,

said type belt carrying characters fixed on a front side thereof facing said print line,

drive means for revolving said type belt whereby said characters are in continuous motion along said print line during printing,

hammer means located at print positions along said straight section opposite said front side of said type belt,

said hammer means being operable to impact an interpositioned recording medium during said motion against said characters on the front side of said straight section of said revolving type belt,

platen means for limiting displacement of said flexible type belt resulting from said impact of said print medium by said hammer means,

said platen means having a stationary impact surface positioned behind said straight section of and proximate the back surface of said type belt,

the improvement comprising means for reducing wear of said type belt caused by frictional contact comprising,

a separate flexible bearing tape of wear-resistant material interposed between said impact surface and said straight section of said type belt for preventing direct frictional contact between said moving type belt and said stationary impact surface,

said bearing tape having oppositely facing bearing surfaces slidably engageable during impact with said impact surface and said straight section of said type belt,

said bearing tape being movable relative to and in the direction of motion of said revolving type belt during impact.

4,489,651

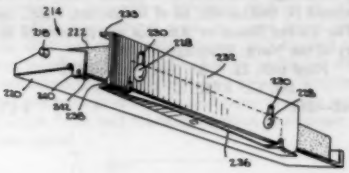
MAILING MACHINE HAVING AN ENVELOPE STRIPPING DEVICE

Albert M. De Luca, New Fairfield, and Danilo P. Buan, Easton, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 8, 1982, Ser. No. 447,812
Int. Cl.³ B41J 11/22
U.S. Cl. 101—93.36 3 Claims

1. A mailing machine for printing postage upon an envelope, comprising: a housing having a slot therein, a platen movably located within said slot, said platen comprising a frame and a resilient member attached to said frame, a print head spaced from and facing said platen resilient member, means for moving said platen toward and away from said print head, a stripper bracket movably attached to said platen frame, spring means secured to said platen frame and in engagement with

said stripper bracket to bias said stripper bracket away from said frame, thereby providing means for removing an envelope



that may adhere to said print head as said platen is driven away from said print head.

4,489,652

METHOD, SYSTEM, AND PLATE BENDING MACHINE FOR REGISTERING IN AN OFFSET PRINTING PRESS

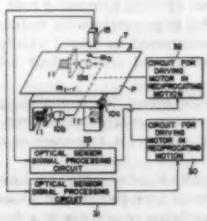
Hideo Takeuchi, Shiroi; Michiaki Kobayashi, Kitamoto; Hiroyuki Hashimoto, Tokyo, and Daiji Suzuki, Hachioji, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1982, Ser. No. 434,241

Claims priority, application Japan, Oct. 15, 1981, 56-164449; Jan. 25, 1982, 57-9882; Jan. 25, 1982, 57-9883; Jan. 25, 1982, 57-9886; Apr. 30, 1982, 57-73022

Int. Cl.³ B41F *13/12, 29/00*

U.S. Cl. 101—211 9 Claims



1. A method for registering in an offset printing press for which sensitized plates of a number corresponding to the number of colors to be printed have been prepared, said method comprising, with respect to each sensitized plate: mounting the printing plate on a shiftable table of a plate bending machine; detecting datum fine lines, which have been inscribed on said plate, by means of optical sensors mounted on the plate bending machine; shifting the shiftable table, in response to the results of the detection thus carried out, so that said datum fine lines are placed at specific positions; inscribing, by means of a register mark inscribing device, register marks for carrying out automatic registering on a printing press with said datum fine lines as datum references while, at the same time, bending the lateral edges of the printing plate said edges extending perpendicularly to the rotational direction of said plate; thereafter mounting the printing plate on a corresponding plate cylinder of the printing press; reading said register marks by means of optical means with the register marks as datum references; and carrying out automatic registering relative to the rotational and lateral directions and twist of the printing plate in response to the results of said reading.

4,489,653

CLAMPING DEVICE FOR CLAMPING PRINTING PLATES ON THE PLATE CYLINDER OF A PRINTING MACHINE

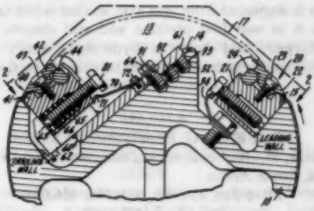
Bert Cappel, Muhlheim; Kurt Difflipp, Dietzenbach; Helmut Emrich, Offenbach am Main; Horst Erbach, Hofheim; Wolfgang Feldt, Grundau; Klaus Neberle, Heusenstamm, and Heinrich Ochs, Oberzell, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 397,821, Jul. 13, 1982, abandoned. This application Jan. 7, 1983, Ser. No. 456,420

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1981, 3127586

Int. Cl.³ B41F *1/28*

U.S. Cl. 101—415.1 11 Claims



1. In a plate cylinder assembly for a printing press and intended for use with thin flexible printing plates of slightly different circumferential lengths, the combination comprising a plate cylinder formed with a longitudinal groove having a bottom, a leading wall and a trailing wall, a clamping rail at the leading wall, a leading edge clamp attached to the clamping rail for gripping the leading edge of the plate, a tensioning rail at the trailing wall mounted in the longitudinal groove for peripheral movement, a trailing edge clamp attached to the tensioning rail for gripping the trailing edge of the plate, a support for supporting the tensioning rail for relative movement, means adjustably mounting said support in said groove in a selected peripheral position with respect to the bottom of the groove for accommodating plates of differing circumferential lengths, said support being of "L"cross-section having a first leg seated with respect to the bottom of the groove and having a second leg presenting an upstanding reference surface interposed between the tensioning rail and the trailing wall of the groove, a set of plate tensioning springs arranged between the tensioning rail and the reference surface for applying peripheral tension to the trailing edge of the plate, resilient latching member mounted on said support for latching the tensioning rail temporarily against the reference surface for overcoming the force of the tensioning springs while the trailing edge of the plate is being gripped, and means for releasing the latch after the trailing edge of the plate is gripped so that the plate tensioning springs are free to tension the plate about the surface of the cylinder.

4,489,654

HYDRODYNAMIC FIRING PIN

Peter H. Van Sloun, Hopkins, and James C. Hall, Buffalo, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 1, 1983, Ser. No. 462,857

Int. Cl.³ F42C *19/08*

U.S. Cl. 102—204 5 Claims

1. In combination:

an explosive propulsion member having an axial percussion primer;

an electric primer mounted to discharge toward said percussion primer along the axis thereof;

a safing mechanism between said primers including a radially contained body of highly viscous material;

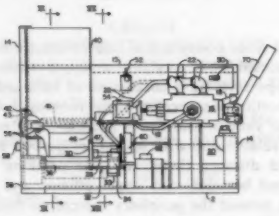
(c) a top member located adjacent and connected to said top rail;
(d) lever members pivotally connected to the upper ends of said side members and engaging said top member; and
(e) power means connected between said lever members to move said lever members toward each other thereby causing said side members to be pivoted toward each other and also simultaneously causing said top member to be moved toward said bottom member.

4,489,649

CAN COMPACTER

Donald H. Daugherty, 10325 N. Government Way, Hayden Lake, Id. 83835

Filed Oct. 31, 1983, Ser. No. 547,127
Int. Cl.³ B30B 9/32
U.S. Cl. 100—215 5 Claims



1. A can compacter assembly comprising a motor, a fluid pump operatively connected to said motor and adapted to be driven by said motor, a frame member, a stationary platen mounted on said frame member, a fluid control valve mounted on said frame member and in communication with said fluid pump, a fluid cylinder mounted on said frame member and in operative communication with said control valve, a piston movably disposed in said cylinder, a stem extending from said piston and through one end of said cylinder and having at its free end a plunger portion, a plunger slide assembly mounted on said frame member, said plunger portion being slidably disposed on said plunger slide assembly, a cradle mounted on said frame member and disposed adjacent to and in alignment with said plunger slide assembly and said platen, said cradle being adapted to receive a can and being further adapted to receive said plunger portion, whereby said plunger portion is adapted to compress said can against said platen is compact said can, a hopper mounted on said assembly and disposed proximate said cradle and adapted to feed cans serially into said cradle, a mechanical linkage between said plunger portion and said hopper, said mechanical linkage comprising a hingedly mounted trap door in said hopper, a rotatable spring-biased wheel proximate said hopper, a pin fixed to said wheel and having a distal end connected to said trap door, a protuberance extending from said wheel, and a dog extending from said plunger portion and adapted to engage said protuberance during a compressive stroke of said plunger portion, said engagement causing rotative movement of said wheel against said spring bias to cause said distal end of said pin to move said trap door hingedly to an open position, thereby permitting movement of a can from said hopper toward said cradle.

4,489,650

TYPE BELT PRINTER WITH ANTIFRICTION MEANS

Werner Hasler, Schoenaich; Subramaniam Padmanabhan, Herrenberg, and Klaus Staudenmaier, Gechingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 885,058, Mar. 9, 1978, abandoned. This application Mar. 6, 1980, Ser. No. 127,614
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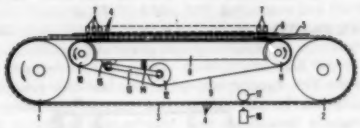


1. An on-the-fly impact printer having the combination of
a continuous flat flexible type belt having a straight section running parallel with a print line,
said type belt carrying characters fixed on a front side thereof facing said print line,
drive means for revolving said type belt whereby said characters are in continuous motion along said print line during printing,
hammer means located at print positions along said straight section opposite said front side of said type belt,
said hammer means being operable to impact an interpositioned recording medium during said motion against said characters on the front side of said straight section of said revolving type belt,
platen means for limiting displacement of said flexible type belt resulting from said impact of said print medium by said hammer means,
said platen means having a stationary impact surface positioned behind said straight section of and proximate the back surface of said type belt,
the improvement comprising means for reducing wear of said type belt caused by frictional contact comprising,
a separate flexible bearing tape of wear-resistant material interposed between said impact surface and said straight section of said type belt for preventing direct frictional contact between said moving type belt and said stationary impact surface,
said bearing tape having oppositely facing bearing surfaces slidably engageable during impact with said impact surface and said straight section of said type belt,
said bearing tape being movable relative to and in the direction of motion of said revolving type belt during impact.

4,489,651

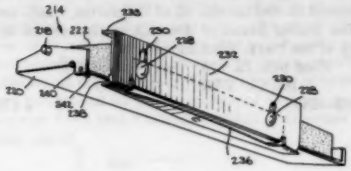
MAILING MACHINE HAVING AN ENVELOPE STRIPPING DEVICE

Albert M. De Luca, New Fairfield, and Danilo P. Buan, Easton, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 8, 1982, Ser. No. 447,812
Int. Cl.³ B41J 11/22
U.S. Cl. 101—93.36 3 Claims

1. A mailing machine for printing postage upon an envelope, comprising: a housing having a slot therein, a platen movably located within said slot, said platen comprising a frame and a resilient member attached to said frame, a print head spaced from and facing said platen resilient member, means for moving said platen toward and away from said print head, a stripper bracket movably attached to said platen frame, spring means secured to said platen frame and in engagement with

said stripper bracket to bias said stripper bracket away from said frame, thereby providing means for removing an envelope



that may adhere to said print head as said platen is driven away from said print head.

4,489,652

METHOD, SYSTEM, AND PLATE BENDING MACHINE FOR REGISTERING IN AN OFFSET PRINTING PRESS

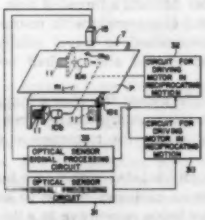
Hideo Takeuchi, Shiroi; Michiaki Kobayashi, Kitamoto; Hiroyuki Hashimoto, Tokyo, and Daiji Suzuki, Hachioji, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1982, Ser. No. 434,241

Claims priority, application Japan, Oct. 15, 1981, 56-164449; Jan. 25, 1982, 57-9882; Jan. 25, 1982, 57-9883; Jan. 25, 1982, 57-9886; Apr. 30, 1982, 57-73022

Int. Cl.³ B41F *13/12, 29/00*

U.S. Cl. 101—211 9 Claims



1. A method for registering in an offset printing press for which sensitized plates of a number corresponding to the number of colors to be printed have been prepared, said method comprising, with respect to each sensitized plate: mounting the printing plate on a shiftable table of a plate bending machine; detecting datum fine lines, which have been inscribed on said plate, by means of optical sensors mounted on the plate bending machine; shifting the shiftable table, in response to the results of the detection thus carried out, so that said datum fine lines are placed at specific positions; inscribing, by means of a register mark inscribing device, register marks for carrying out automatic registering on a printing press with said datum fine lines as datum references while, at the same time, bending the lateral edges of the printing plate said edges extending perpendicularly to the rotational direction of said plate; thereafter mounting the printing plate on a corresponding plate cylinder of the printing press; reading said register marks by means of optical means with the register marks as datum references; and carrying out automatic registering relative to the rotational and lateral directions and twist of the printing plate in response to the results of said reading.

4,489,653

CLAMPING DEVICE FOR CLAMPING PRINTING PLATES ON THE PLATE CYLINDER OF A PRINTING MACHINE

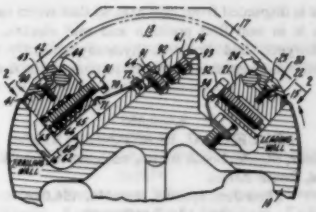
Bert Cappel, Muhlheim; Kurt Difflipp, Dietzenbach; Helmut Emrich, Offenbach am Main; Horst Erbach, Hofheim; Wolfgang Feldt, Grundau; Klaus Neberle, Heusenstamm, and Heinrich Ochs, Oberzell, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmashinen Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 397,821, Jul. 13, 1982, abandoned. This application Jan. 7, 1983, Ser. No. 456,420

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1981, 3127586

Int. Cl.³ B41F *1/28*

U.S. Cl. 101—415.1 11 Claims



1. In a plate cylinder assembly for a printing press and intended for use with thin flexible printing plates of slightly different circumferential lengths, the combination comprising a plate cylinder formed with a longitudinal groove having a bottom, a leading wall and a trailing wall, a clamping rail at the leading wall, a leading edge clamp attached to the clamping rail for gripping the leading edge of the plate, a tensioning rail at the trailing wall mounted in the longitudinal groove for peripheral movement, a trailing edge clamp attached to the tensioning rail for gripping the trailing edge of the plate, a support for supporting the tensioning rail for relative movement, means adjustably mounting said support in said groove in a selected peripheral position with respect to the bottom of the groove for accommodating plates of differing circumferential lengths, said support being of "L"cross-section having a first leg seated with respect to the bottom of the groove and having a second leg presenting an upstanding reference surface interposed between the tensioning rail and the trailing wall of the groove, a set of plate tensioning springs arranged between the tensioning rail and the reference surface for applying peripheral tension to the trailing edge of the plate, resilient latching member mounted on said support for latching the tensioning rail temporarily against the reference surface for overcoming the force of the tensioning springs while the trailing edge of the plate is being gripped, and means for releasing the latch after the trailing edge of the plate is gripped so that the plate tensioning springs are free to tension the plate about the surface of the cylinder.

4,489,654

HYDRODYNAMIC FIRING PIN

Peter H. Van Sloun, Hopkins, and James C. Hall, Buffalo, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 1, 1983, Ser. No. 462,857

Int. Cl.³ F42C *19/08*

U.S. Cl. 102—204 5 Claims

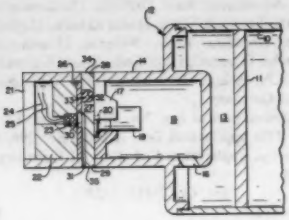
1. In combination:

an explosive propulsion member having an axial percussion primer;

an electric primer mounted to discharge toward said percussion primer along the axis thereof;

a safing mechanism between said primers including a radially contained body of highly viscous material;

and means mounting said mechanism for movement transverse to said axis between a first position, in which said body is on said axis, and a second position, in which said



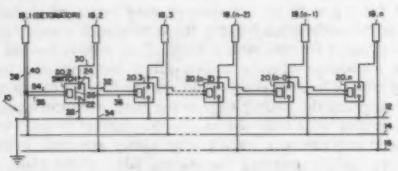
body is displaced from said axis, so that when said mechanism is in said first position and said electric primer is discharged, said body is hydrodynamically propelled against said percussion primer to cause it to fire.

4,489,655

SEQUENTIAL BLASTING SYSTEM

Otto Molnár, Strand, South Africa, assignor to Bakke Industries Limited, South Africa

Filed Jan. 6, 1983, Ser. No. 456,098
Int. Cl.³ F42D *1/06*
U.S. Cl. 102—217 **4 Claims**



1. A sequential blasting system, which includes

(a) an electrical supply circuit including a common earth conductor, a first electrical conductor, and a second electrical conductor, all three conductors being connectable to a source of electrical energy;

(b) a series of detonator circuits in which a detonator circuit is provided for each detonator to be exploded, each such circuit including a first detonator conductor adapted to connect its detonator electrically to either of the first and the second electrical conductors, and a second detonator conductor adapted to connect its detonator electrically to the common earth conductor, such that the first detonator conductor of each alternate detonator circuit is connected to the first electrical conductor and the first detonator conductor of each of all other detonator circuits is connected to the second electrical conductor;

(c) a pyrotechnical activated switch (=PAS) for each detonator circuit including a bridge member, two control contacts and a firing part adapted to cause the bridge member to bridge the two control contacts when being energized by the supply of electricity to it, the two control contacts being located to interrupt either of the first detonator conductor and the second detonator conductor of its detonator circuit, and the firing part being connected in parallel to the detonator of the previous detonator circuit by connection to the first and second detonator conductors of the previous detonator circuit so that when current is supplied to one detonator current is simultaneously also supplied to the firing part of the next PAS; and

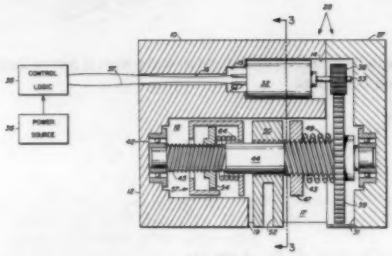
(d) connection means for connecting the first electrical conductor and the second electrical conductor to an alternating sequencer for supplying electrical current alternatingly to the first and second electrical conductors.

4,489,656

PENETRATING ORDNANCE SAFE AND ARMING MECHANISM

George N. Hennings; Richmond H. Nickles; Larry F. Brauer, and Raymond H. DeHarrold, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 22, 1983, Ser. No. 468,422
Int. Cl.³ F42C *15/34, 15/40*
U.S. Cl. 102—254 **8 Claims**



1. A safe and arming mechanism comprising:

a cylindrical body having a housing member, an end plate and means for attaching said end plate to said housing member, said housing member defining an arming notch;

a motor mounted in said housing member, said motor energized in response to an externally generated signal;

an arming shaft having a right-hand threaded end, an unthreaded central portion and a left-hand threaded end, said arming shaft mounted for rotation in said body;

means for transmission of motive power output, said means operatively coupling said motor to one threaded end of said arming shaft;

a timing member defining a threaded hole, said timing member in threaded engagement with, restrained from rotation with and constrained to travel axially along said one threaded end of said arming shaft within said arming notch;

first compressible means for transmitting force, said first compressible means interposed between said timing member and said means for transmission of motive power output;

a detonator fixedly located within said housing member to communicate its explosive output to said arming notch, said detonator being responsive to a detonation signal;

an arming block defining a threaded hole, said arming block in threaded engagement with, restrained from rotation with and constrained to travel axially along the end of said arming shaft opposite said one threaded end;

an explosive lead member defining a threaded hole configured for threaded engagement with said one threaded end of said arming shaft, said explosive lead member slidably disposed in said arming notch, restrained from rotation with and constrained to travel axially along said arming shaft and positionable between a safe position, in which said explosive lead member is slidably engaged on and penetrated by said unthreaded central portion of said arming shaft, and an armed position, in which said explosive lead member is in threaded engagement with and is penetrated by said one threaded end of said arming shaft, said explosive lead member further defining an open-ended explosive lead passage one end of which is positionable adjacent said detonator when said explosive lead member is in said armed position;

second compressible means for transmitting force, said second compressible means interposed between said arming block and said explosive lead member, said second compressible means configured to selectively contact said

explosive lead member in response to said axial movement of said arming block along said end of said arming shaft opposite said one threaded end; and

a mechanical interlock operable within said housing member positionable between a blocking position in which the threadible engagement with and axial travel along said one threaded end of said arming shaft by said explosive lead member is prevented and a free position in which said axial travel of said explosive lead member is unrestrained, said mechanical interlock configured to move to said free position from said blocking position in response to a release signal.

4,489,657

INSULATING LAYER FOR A ROCKET PROPELLANT OR ROCKET MOTOR

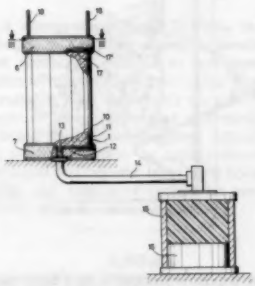
Heinz-Günther Langer, Gauting, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Feb. 11, 1982, Ser. No. 347,685

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1981, 3105932

Int. Cl.³ C06D *5/06*

U.S. Cl. 102—290 **11 Claims**



1. A front or face burning type rocket motor, comprising housing means forming a combustion chamber and including two end cover members, nozzle means in one of said end cover members, fuel means having a nozzle facing end for ignition in said housing means, and an insulating layer in said housing means for spacing said fuel means from said housing means at least at those sections of the housing means other than said end cover members, said insulating layer consisting exclusively of a single layer of synthetic foamed polybutadiene insulating material in said housing.

4,489,658

BALLAST SHOULDER CONSOLIDATOR

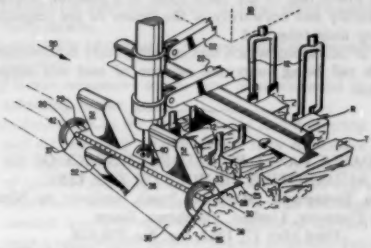
Helmuth von Beckmann, 189 Castle Rd., Columbia, S.C. 29210

Filed Jul. 26, 1982, Ser. No. 401,987

Int. Cl.³ E01B *27/02*

U.S. Cl. 104—12 **3 Claims**

1. A railroad track-working machine comprising a vibratory ballast surface compactor mounted on the machine, said compactor having a top ballast-engaging plate means and a second ballast-engaging plate means hingedly connected thereto along an outer longitudinal edge thereof; said top plate means having a leading edge, a trailing edge, and a ballast compacting undersurface; said second ballast-engaging plate means having a leading edge, a trailing edge and a ballast compacting innersurface; the leading edges of said top and second ballast engaging plate means being wider, transversely of the track, than their respective trailing edges; said top plate means being mounted so as to present, in ballast compacting operation, its leading edge at a level higher above the ballast surface than its trailing edge; said under-surface sloping rearwardly in the direction of track working from said top plate leading edge to its trailing edge; means for rotating at least one of said plate



means relative to the other, about said hinged connection and means for locating said top plate trailing edge, in operation, at a selected level, for ballast compaction.

4,489,659

TRUSS-TYPE GIRDER FOR SUPPORTING A MOVABLE BODY

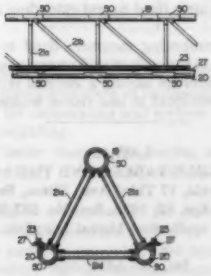
Hideaki Kamohara, Kudamatsu; Minoru Imamura, Yamaguchi; Hiroshi Higaki, Kudamatsu; Yuji Yoshitomi, Kudamatsu; Syuzo Uno, Kudamatsu; Kazuhiro Makino, Kudamatsu; Hiroshi Nomura, and Kyozo Yoshioka, both Hikari, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 107,645, Dec. 27, 1979, abandoned. This application Oct. 9, 1981, Ser. No. 310,234

Claims priority, application Japan, Jan. 10, 1979, 54-1968; Jan. 10, 1979, 54-1969

Int. Cl.³ E01B *25/22*

U.S. Cl. 104—124 **4 Claims**



1. A girder for supporting a movable body, having a truss structure of a cross-sectional shape forming an isosceles triangle with a horizontal base, comprising:

only three main tubes, each of said main tubes having a circular cross section and being located in a position corresponding to a respective one of three corners of the triangle and extending continuously over the length of the girder;

a plurality of joint pieces, said joint pieces being arranged at equal intervals along each of said main tubes with each joint piece on one main tube being secured abreast a respective joint piece on the other two of said main tubes;

a plurality of branch tubes of a circular cross section, each of said branch tubes being disposed between a respective two of said main tubes and being fixed at its ends by respective joint pieces, wherein the respective joint pieces arranged abreast one another on the three main tubes are connected by a respective three of said branch tubes that lie in a plane

extending through the respective joint pieces perpendicular to the longitudinal axes of the main tubes so as to form said isosceles triangle;

a pair of rail support means, each being secured to a respective lower one of the main tubes at a position disposed upwardly and outwardly of the center of the respective lower main tube; and

a pair of rails along which said movable body is traversable, each rail being supported on one of said rail support means.

4,489,660

FOLDABLE PANEL FOR STORAGE SPACE OF AN AUTOMOTIVE VEHICLE OR THE LIKE

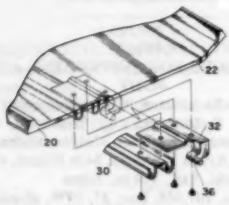
Masahiro Tamamushi, Machida, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 17, 1982, Ser. No. 378,626

Claims priority, application Japan, May 27, 1981, 56-79142

Int. Cl.³ A47B *23/00*

U.S. Cl. 108—44 **3 Claims**



1. A parcel shelf for a vehicle comprising:

(a) a sheet;

(b) means defining a recess extending across said sheet, said recess means dividing said sheet into a first panel and a second panel interconnected by a thin flexible portion;

(c) a reinforcing strip fixed to and extending across said first panel; and

(d) a pair of reinforcing members fixed to said first and second panels at the ends of said recess means, each of said reinforcing members having a stepped portion sized and shaped to be received in said recess means.

4,489,661

FOLDABLE TABLES AND THE LIKE

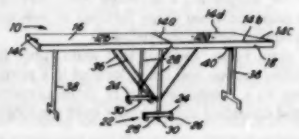
Patrick W. Fitzgerald, 17 Third Ave., Filton, Bristol, England

Filed Apr. 12, 1982, Ser. No. 367,596

Claims priority, application United Kingdom, Apr. 12, 1981, 8112797

Int. Cl.³ A47B *3/00*

U.S. Cl. 108—113 **6 Claims**



1. A foldable article of furniture comprising: an upper surface member which comprises two sections which are mutually pivotally connected adjacent respective side edges so as to be pivotable downwardly from an erected configuration to a folded configuration; first and second elongate support means for the article, each extending downwardly generally beneath the surface member and having a respective ground-engageable lower end portion, said first support means being pivotally connected adjacent its upper end region to the upper surface member adjacent said pivoted side edges thereof, and wherein one of said first and second support means comprises at least one upright tubular portion through which a respective portion of the other support means extends slidably; and at least one strut which is pivotally connected at respective spaced regions thereof firstly to the upper surface member at a region spaced from said pivoted side edges and secondly to said second support means; the first and second support means and the at least one strut being dimensioned and arranged so that in the erected configuration substantial support is afforded by the first support means, and downward pivoting of said sections of the upper surface member causes relative sliding of the first and second support means so that in the folded configuration substantial support is afforded by the second support means.

4,489,662

AFTER HOUR DEPOSITORY

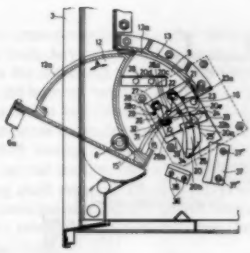
Hiroshi Masachika, Hiroshima, Japan, assignor to Kumahira Safe Co., Inc., Japan

Filed Sep. 17, 1982, Ser. No. 419,605

Claims priority, application Japan, May 20, 1982, 57-84010

Int. Cl.³ E05G *1/026*

U.S. Cl. 109—66 **23 Claims**



1. An after hour depository comprising a door casing rotatable between open and closed positions about a shaft extending across both the side walls of a framework, movable wall means in operative association with said door casing for developing a pocket in which a bag or an envelope including money to be deposited is placed, sleeve rollers disposed on both the sides of the movable wall means, ratch means for guiding the movement of said sleeve rollers under limitative control, wherein said ratch means includes a pivotal ratch having an engagement pawl with a concave portion against which the sleeve roller is adapted to be firmly held during return movement of said door casing from said open position to said closed position to prevent reverse pivotal movement of said door casing towards said open position, a back plate integral with said ratch, a driving plate located opposite to the ratch, said driving plate being pivotal in the opposite direction to that of said ratch, and holding plate means in operative association with said driving plate, said holding plate means being disengaged from said ratch in response to said driving plate being pivotally moved in a direction opposite said ratch by virtue of said sleeve rollers coming into contact therewith.

4,489,663

LIGHT WEIGHT VAULT DOOR

D. W. Poag, Ottawa, and W. R. Merritt, Nepean, both of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Jul. 29, 1982, Ser. No. 403,052

Claims priority, application Canada, Sep. 16, 1981, 386021

Int. Cl.³ E05G *1/026*; E04B *2/02*

U.S. Cl. 109—76 **3 Claims**

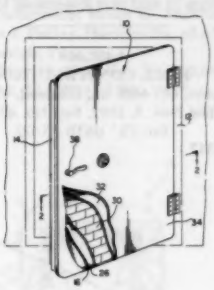
1. A security vault having a door of reduced weight con-

structed and arranged to delay penetration when being illegally entered, said door comprising a plurality of layers in the order as follows:

an outer thin metal layer;

a sheet of metal having thermal conductivity higher than said outer metal layer adhesively secured to said outer metal layer;

a continuous layer of aluminum oxide tiles adhesively secured to said conductive metal layer, said tiles being disposed adjacent each other without gaps therebetween;



a layer of energy-absorbing polymeric material selected from the group consisting of polycarbonate and an acrylic polymer adhesively secured to said layer of aluminum oxide tiles with a hard silicone rubber, and

an inner metallic layer adhesively secured to and covering said layer of energy-absorbing polymeric material; said layers being chosen and designed whereby said door is light in weight; wherein the energy-absorbing polymeric layer protects said ceramic layer from being penetrated by pounding, and said door cannot be penetrated with a signle tool, so as to delay illegal entry.

4,489,664

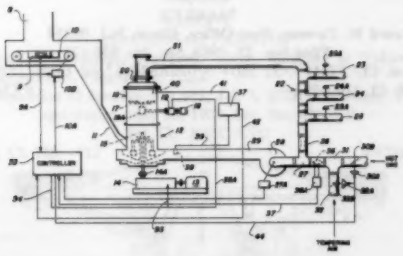
CLOSED LOOP FUEL FEED SYSTEM FOR MULTIPLE DIRECT FIRED BURNERS

Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

Filed Nov. 14, 1983, Ser. No. 551,286

Int. Cl.³ F23N *5/18*

U.S. Cl. 110—186 **8 Claims**



1. A closed loop fuel feed system for multiple direct fired burners comprising:

(a) fuel grinding and particle size classifying means having an inlet for fuel to be ground, an air inlet and a ground fuel and air outlet;

(b) conduit means connected between said ground fuel and air outlet and said air inlet constituting a substantially closed loop for the movement of ground fuel and air;

(c) fan means inserted into said conduit means constituting said closed loop for effecting the movement of ground fuel and air;

(d) a series of ground fuel and air outlets connected into said closed loop in consecutive order for extracting the ground fuel and air for delivery to burners;

(e) means for delivering fuel to said fuel grinding and classifying means;

(f) means for admitting air into said conduit means from the exterior;

(g) means responsive to the flow of air mounted in said air admitting means; and

(h) control means for operating said fuel delivering means, said air admitting means, said air flow responsive means, and said fan means, said control means initiating operation of said fuel grinding means upon response of said air flow responsive means indicating sufficient air admitted to said conduit means to support combustion of the fuel and to main a substantially uniform density of ground fuel and air extracted at each of said outlets connected into said closed loop.

4,489,665

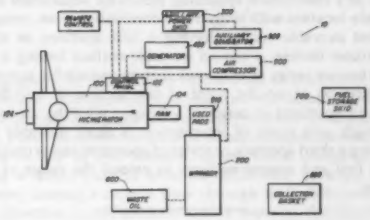
MOBILE, SORBENT-PAD DISPOSAL SYSTEM

William M. Ayers, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 16, 1984, Ser. No. 590,119

Int. Cl.³ F23G *5/12, 5/02*

U.S. Cl. 110—250 **3 Claims**



1. A movable incineration system for the disposal of sorbent pads used in the cleanup of spills of hydrocarbons comprising:

an incinerator for incinerating said sorbent pads therein, the incinerator including:

a ram type feeder thereon for feeding said sorbent pads into the primary combustion chamber of the incinerator; and

a reactor section connected to the primary combustion chamber of the incinerator;

a wringer for partially removing said hydrocarbons from said pads before the incineration thereof, the wringer comprising:

a frame;

a porous belt conveyor mounted on the frame;

a resiliently mounted roller on the frame in contact with the porous belt conveyor; and

a drive motor connected to the porous belt conveyor;

a generator for providing electrical power to the incinerator;

an air compressor for providing compressed air to the incinerator; and

an auxiliary power skid unit for providing at least electrical power to the incinerator upon the cessation thereof from the generator, the auxiliary power skid unit comprising:

a frame;

a fuel tank assembly mounted on the frame;

a fire extinguisher assembly mounted on the frame;

a battery power assembly;

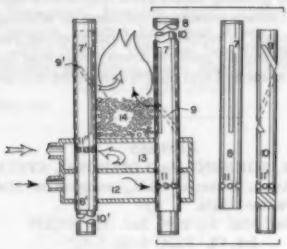
a battery charger for charging the battery power assembly;

a power inverter assembly for converting direct current to alternating current;
a fuel pump assembly; and
a water tank assembly.

4,489,666
MOVABLE AIR SUPPLY FOR COMBUSTION APPARATUS

Edwin L. McCurdy, 1074 S. Dahlia #G-202, Denver, Colo. 80222

Filed Mar. 16, 1984, Ser. No. 590,144
Int. Cl.³ F23H *3/00*
U.S. Cl. 110—297 **2 Claims**

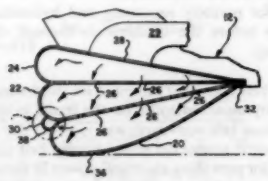


1. In a combustion apparatus, means for adjustment of an air supply location with respect to a combustion zone, comprising, a first movable surface having a first aperture or series of apertures therein, a second movable surface having a second aperture or series of apertures therein, means for moving said surfaces to adjust the point of intersection of said first and second apertures or series of apertures whereby air may pass through said point of intersection, a third movable surface having a third aperture or series of apertures and arranged with said first and second surfaces to extend the range of adjustment.

4,489,667
SURFACE EFFECT SHIP SEALS

Robert G. Moore; Anthony Y. Simpson, both of Slidell, and Howard W. Keefe, New Orleans, all of La., assignors to Textron Inc, Providence, R.I.

Filed Jan. 13, 1983, Ser. No. 457,720
Int. Cl.³ B63B *1/38*
U.S. Cl. 114—67 A **11 Claims**

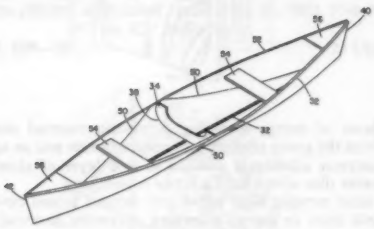


1. In a seal structure for controlling maintenance of a cushion of air under a vessel capable of travelling over an irregular water surface at high speeds; said structure comprising primarily a laminate of air-inflated pillow-like lobes fabricated of flexible, air impervious sheet material defining a partition sheet means providing a boundary between adjacent lobes and bulbous aft portions, wherein the bulbous aft portion of each lobe depends from and is supported by the bulbous aft portion of an adjacent upper lobe and cooperates therewith to define a cleft therebetween and said partition sheet means has leading portions thereof fixed to said vehicle and aft portions thereof fixed to said bulbous aft portions at each said cleft, whereby when operating over irregular water surfaces the bulbous aft portion of the lowermost primary lobe of said seal structure is prone to bounce upon said water surface and alternately slam against and snap back relative to the bulbous aft portion of the next above lobe of said structure; the improvement comprising:
providing an air-inflated bounce damping lobe bridging in interfacing relationship the cleft between the bulbous aft portions of the two lowermost lobes of said seal structure; said bounce damping lobe being attached at its leading edge portions to said two lowermost lobes.

4,489,668
HULL CONSTRUCTION

Thomas B. Cronin, 687 66th St., Oakland, Calif. 94609

Filed Nov. 3, 1982, Ser. No. 439,072
Int. Cl.³ B63B *35/00*
U.S. Cl. 114—347 **18 Claims**

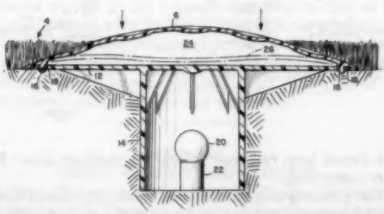


1. A boat comprising a hull with a bow section and a stern section, said bow section being formed of a main panel of generally isosceles triangle configuration, the apex of said main panel being at the bow of said hull and the base of said main panel being shaped in smoothly curved transverse configuration, and
a pair of bow panels of generally triangular configuration, the short sides of said bow panels being joined together to form the bow of said hull and secured to the apex of said main panel, and a longer side of each said bow panel being longitudinally shaped and being secured to an edge of said main panel.

4,489,669
MARKER

Edward W. Carman, Post Office, Elmer, N.J. 08318

Filed Sep. 23, 1983, Ser. No. 535,123
Int. Cl.³ F21Q *3/00*; E01F *9/02*; A63B *57/00*; G09F *19/00*
U.S. Cl. 116—202 **8 Claims**



1. A marker comprising a base adapted to be secured to the ground, said base having a first outer periphery, securing means attached to said base for securing said base to the ground, and visible means attached to said base, said visible

means being flexible and concave to said base when not deformed and having a second outer periphery which engages said first outer periphery for holding said visible means to said base, said first and second outer periphery having connection means such that said first outer periphery is slidably connected to said second outer periphery to allow said second outer periphery to move with respect to said first outer periphery.

4,489,670

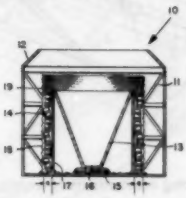
FIXTURE FOR CENTRIFUGAL APPARATUS

Mark F. Mosser, Sellersville; Bruce G. McMordie, Philadelphia, and William J. Fabiny, Harleysville, all of Pa., assignors to Sermetel, Limerick, Pa.

Filed May 16, 1983, Ser. No. 495,047

Int. Cl.³ B05C *7/00, 11/08*

U.S. Cl. 118—55 **36 Claims**



1. Means adapted for insertion into a container of a centrifugal apparatus used in coating a plurality of parts, and capable of orienting said parts within said container, said means comprising:

an inner member adapted for fixed rotation with said container and for initially receiving said parts, said inner member being sloped so as to permit centrifugal forces to carry said parts out of said inner member during a spinning cycle and terminating at an edge spaced from top portions of said container so as to permit parts to pass said edge during said spinning cycle, and

at least one apertured member depending from the edge of said inner member and surrounding said inner member so as to form at least one compartment between side walls of the container and said apertured member, said compartment having a size capable of receiving and orienting said parts according to size or shape of said parts.

4,489,671

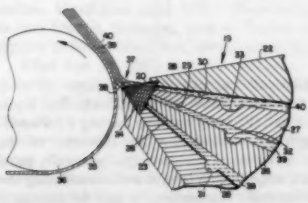
COATING APPARATUS

Edward J. Choinski, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 921,445, Jul. 3, 1978, abandoned. This application May 25, 1983, Ser. No. 498,079

Int. Cl.³ B05C *5/02*

U.S. Cl. 118—412 **4 Claims**



1. A multilayer coater, comprising a plurality of elongated applicator plates, means mounting said plates in spaced relation to form a plurality of converging flow channels elongated in a direction normal to the direction in which said channels are converging, and an elongated porous element mounted at the convergent ends of said channels and blocking said convergent ends, whereby fluid compositions supplied to said channels under pressure will flow through said element while experiencing pressure drops that are large compared to the cross stream pressure drops in said channels.

4,489,672

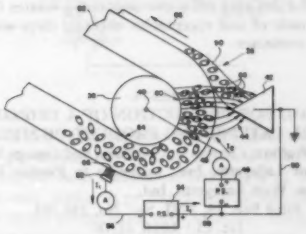
APPARATUS FOR COATING SEMICONDUCTIVE MATERIAL

Semyon Kisler, West Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 5, 1981, Ser. No. 222,333

Int. Cl.³ B05B *5/02*; B05C *5/00*

U.S. Cl. 118—620 **10 Claims**



1. Apparatus for applying an operational electric field to a given surface of semiconductive material, the apparatus comprising a first electrode spaced from a given point on said given surface, a second electrode located in adjoining relation to the opposite surface of said material, means when energized for applying a direct current potential difference between said electrodes, causing a current flow through said given point in a given direction in said semiconductive material, the improvement comprising:

a third electrode located in adjoining relation to said material; and

means, when energized for applying a direct current potential difference between said first and third electrode of opposite polarity to the potential difference between said first and second electrode to produce a current flow in a direction opposite said given direction and of a magnitude to reduce the net current flow through said material at said one point.

4,489,673

EQUIPMENT FOR THE RAISING OF EELS, CRAYFISH AND OTHER BOTTOM-LIVING MARINE ORGANISMS

Henn Pohlhausen, Friedrichstr. 56, Buchholz, Fed. Rep. of Germany

PCT No. PCT/EP82/00193, § 371 Date May 9, 1983, § 102(e) Date May 9, 1983, PCT Pub. No. WO83/00798, PCT Pub. Date Mar. 17, 1983

PCT Filed Sep. 4, 1982, Ser. No. 492,024

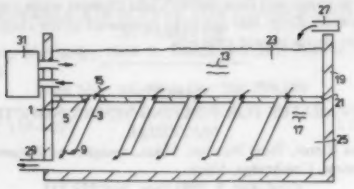
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1981, 3135653

Int. Cl.³ A01K *61/00*

U.S. Cl. 119—2 **8 Claims**

1. Apparatus for raising marine organisms comprising eels, crayfish, and similar cave- or bottom-living marine organisms which comprises a container adapted to hold water suitable for raising said marine organisms, a plurality of substantially tubular hiding receptacles suitable as a habitat for said organisms, a supporting base for said receptacles dividing said container into a freshwater section and a dirty-water section, said receptacles extending through and secured to said supporting base

and opening at one end into the freshwater section of said container and opening at the other end into the dirty-water section of said container, each of said receptacles having a constriction at the other end thereof sufficient to prevent the



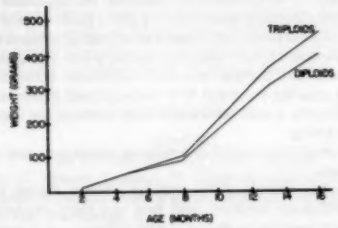
escape of said marine organisms therethrough, means for supplying freshwater to said freshwater section of said container, and means for drawing off water containing wastes from the constricted ends of said receptacles into said dirty-water section of said container.

4,489,674

METHOD FOR PRODUCTION OF A TRIPLOID CHANNEL CATFISH AND PRODUCT OF METHOD

William R. Wolters; Charles L. Chrisman, and George S. Libey, all of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Feb. 25, 1981, Ser. No. 238,101
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—3 **3 Claims**



1. The method of induction of triploidy in a channel catfish comprising the steps of:

securing an egg from a female channel catfish and fertilizing said egg with sperm;

treating said fertilized egg beginning up to about 5 minutes after fertilization by immersion in water at a temperature of up to about 5° C. for a time up to about 1 hour;

incubating said egg after said treatment under normal incubation conditions;

whereby a viable fry is produced that is a triploid channel catfish.

4,489,675

SCRAPER ASSEMBLY

Anthony J. Siciliano, South Lyon, Mich., assignor to Diamond Automations, Inc., Farmington, Mich.

Filed Jan. 18, 1982, Ser. No. 339,866
Int. Cl.³ A01K *31/04*; B65G *25/04*
U.S. Cl. 119—22 **10 Claims**

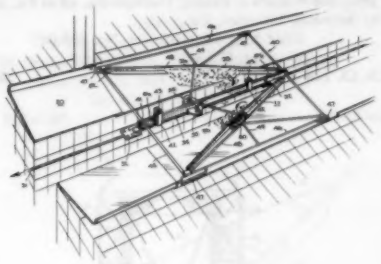
1. A reversible scraper system adapted to clean a manure collecting sheet utilized in battery cage row arrangements for raising poultry which comprises:

a pull bar member disposed adjacent the inner edge of the manure collecting sheet;

drive means operatively coupled to said pull bar member for moving said pull bar member parallel to and along a length of said manure collecting sheet;

means for reversing said pull bar drive means upon moving the length of said manure collecting sheet;

a scraper blade member disposed angularly with respect to said manure collecting sheet having a leading end portion thereof extended sufficiently to clear an outer portion of said manure collecting sheet and a trailing end portion extending inwardly toward said pull bar member sufficiently to clear an inner portion of said manure collecting sheet, the scraper blade member further having a scraper



face always facing substantially toward said pull bar member and slidably moving along the manure collecting sheet in response to said drive means, and a trailing face always facing away from said pull bar member; and

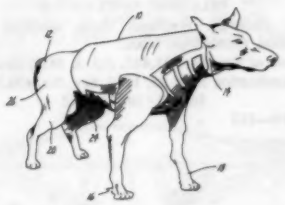
coupling means for coupling said pull bar member and scraper blade member to facilitate reversing the position of said leading and trailing end portions of said angularly disposed scraper blade member, said coupling means engaging with said scraper blade member at a pivot point disposed essentially midway between said leading and trailing end portions and at a predetermined lateral distance from said pull bar member.

4,489,676

CANINE CERVICAL JACKET

Russell W. Colquist, Livonia, Mich., assignor to Bio-Medical Innovations, Inc., Okemos, Mich.

Filed Nov. 14, 1983, Ser. No. 550,830
Int. Cl.³ A01K *15/04*
U.S. Cl. 119—96 **7 Claims**



1. A canine cervical jacket, comprising:

a body member formed of a relatively flat, liquid resistant foam insert, the body member having a forward edge with a length accommodating the diameter of the animal's throat, a rearward, longer edge, generally parallel to the forward edge with a length accommodating the diameter of the animal's midsection, a pair of convex side edges extending forward from the rear edge, a pair of tapered concave side edges extending rearwardly from the forward edge of the body, and a pair of spaced, leg-receiving openings between the side edges; and

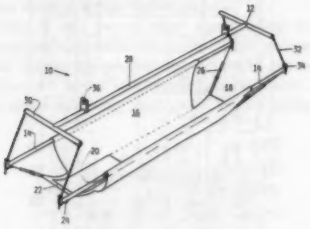
a jacket cover comprising a pair of fabric members joined together about their side edges to form a cover for the body member, the cover having a pair of leg-receiving openings accommodating the openings in the body member, and fastener means mounted adjacent said side edges for releasably fastening together the side edges of the cover at such times as the jacket cover is mounted on the animal's back such that the side edges of the body are closely opposed, but not over lapping beneath the animals throat and chest.

4,489,677

ANIMAL SUPPORT SLING

John E. Handley, Matamata, New Zealand, assignor to Matamata Motor Trimmers Limited, Matamata, New Zealand

Filed Jan. 13, 1983, Ser. No. 457,588
Int. Cl.³ A61D 3/00
U.S. Cl. 119—102 **6 Claims**



1. An animal support apparatus comprising an elongated support frame adapted for engagement with a lifting means and having an elongated cross member at each end thereof, suspension elements depending from each end of the cross members, a pair of laterally spaced apart elongate members supported by said suspension members, a sling with lateral edges, means for mounting said sling along its lateral edges to the elongate members as to be supported therebetween, the elongate members extending longitudinally well clear of the means for mounting said sling and the sling incorporating end flaps disposed centrally of each end thereof a first end of each flap secured to an associated end of the sling and each flap having an opposite end, straps which are secured to the opposite ends of each flap and are removably attachable to an associated end of said elongate members, the end flaps being supported in a longitudinally extended position by said straps when attached to the associated ends of the elongate members, thereby defining leg accommodating apertures, in use the sling fitting beneath an underside of an animal with each leg of the animal extending through the associated leg accommodating aperture such that with raising of the support the weight of the animal is taken adjacent the inside of the top of each of its legs.

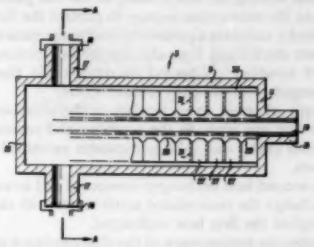
4,489,678

APPARATUS FOR THE CONVERSION OF ENERGY

Raoul Hamilton, Ovesholms gods, S-291 92 Kristianstad; Lars E. Sehlin, and Sten A. Svensson, both of Tollarp, all of Sweden, assignors to Raoul Hamilton, Kristianstad, Sweden

Filed Apr. 18, 1983, Ser. No. 486,232
Claims priority, application Sweden, Apr. 20, 1982, 8202474
Int. Cl.³ F22B 3/06; F24C 9/00
U.S. Cl. 122—26 **11 Claims**

1. An apparatus for the conversion of mechanical energy or kinetic energy into heat, comprising a hydraulic pump for supplying energy to a hydraulic liquid under pressure buildup and an energy transformer to which the hydraulic liquid is supplied by the pump, conduit means to recirculate the hydraulic liquid after release of generated heat back to the pump, wherein the energy transformer includes a casing of elongated, preferably cylindrical configuration, having at least one inlet axially arranged at one end of the casing and at least one outlet radially extending from the casing for the hydraulic liquid and velocity increasing restrictions for generating friction between said inlet and outlet including a centrally positioned axial tube extending from the inlet and in communication with the outlet and provided with perforations which communicate with radial passages defined by a plurality of washers positioned on said axially extending tube, side surfaces of said plurality of washers provided with radial grooves such that a pair of said



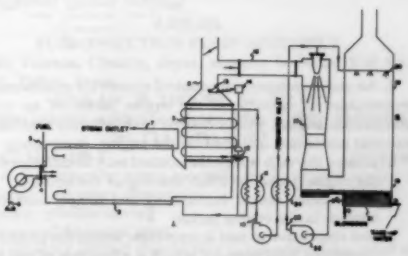
washers in juxtapose relationship form said radial passage, an annular gap defined between an inner circumference of said casing and an outer circumferential extent of said washers, wherein each washer is provided with at least one outer peripheral recess cooperating with an axially extending bar arranged on said inner circumference of the casing, whereby the orientation of the grooves will be fixed, said radial grooves in fluid communication with said annular gap so that the kinetic or mechanical energy of the hydraulic fluid is converted into heat energy by passage through said velocity increasing restrictions.

4,489,679

CONTROL SYSTEM FOR ECONOMIC OPERATION OF A STEAM GENERATOR

Fletcher O. Holt, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 12, 1983, Ser. No. 560,463
Int. Cl.³ F22D 5/00
U.S. Cl. 122—451 S **3 Claims**



1. A control system for a once-through steam generator which has a radiant section and a convection section with a surface area which enables it to reduce the output flue gas temperature to the dew point of acid gases, including,

a burner mounted in the radiant section supplied fuel and air at constant rates and discharging products of combustion into the radiant section from which they flow into and are discharged from the convection section,

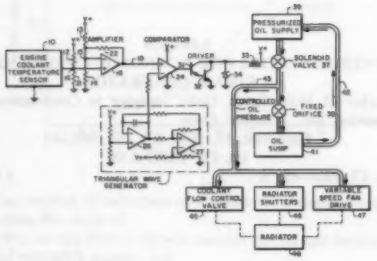
a constant supply of feedwater connected to the convection section to be heated,
a first heat exchanger connected between the feedwater supply and the convection section,
a conduit system connecting the first heat exchanger with feedwater heated by the convection section,
a first valve in the conduit system which connects the convection section to the first heat exchanger with which to regulate the quantity of water heated by the convection section and passed in heat exchange with the feedwater supplied the convection section,
a means sensing the temperature of the flue gases discharged from the convection section to control the first valve and thereby maintain a predetermined temperature for the flue gases discharged from the convection section,
a wet scrubber connected to receive the flue gases discharged from the convection section,
a supply of water to recirculate in the scrubber to contact the flue gas input to the scrubber and reduce the sulfur oxides (SO_x) and solid particulates entrained by the flue gases,
and a second heat exchanger connected and arranged to heat exchange the recirculated scrub water with the feedwater supplied the first heat exchanger,
whereby the temperature of the flue gas input to the scrubber is limited to such that all the heat available in the flue gases is salvaged as sensible heat from the recirculated scrubber water into the feedwater flowing to the second heat exchanger.

4,489,680

ENGINE TEMPERATURE CONTROL SYSTEM

Romas B. Spokas, and Fred D. Sturges, both of Rockford, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 23, 1984, Ser. No. 573,188
Int. Cl.³ F01P 3/20
U.S. Cl. 123—41.05 **11 Claims**



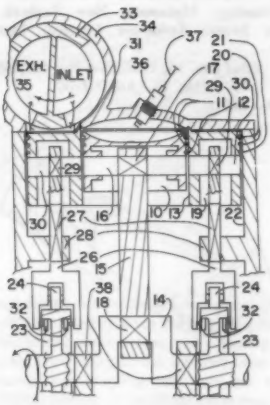
1. An engine temperature control system for maintaining the temperature of coolant, in the engine jacket of an internal combustion engine, within desired narrow limits regardless of external conditions and load on the engine, comprising:
a radiator through which the coolant may be circulated from the engine jacket to effect cooling of the coolant;
a temperature sensor for sensing the temperature of the coolant in the engine jacket;
means responsive to said temperature sensor for producing a controlled fluid pressure which is a function of and represents the sensed temperature;
a coolant flow control valve which responds to the fluid pressure, when the sensed coolant temperature is in a relatively low temperature range, to vary the amount of coolant diverted to and flowing through the radiator;
radiator shutters controlled by the fluid pressure, when the sensed temperature is in a medium temperature range above the low temperature range, for adjusting the amount of ram air impinging on the radiator;
and a variable speed fan drive responsive to the fluid pressure, when the sensed coolant temperature is in a relatively high temperature range above the medium range, for blowing a controlled amount of air through the radiator.

4,489,681

MULTIPLE PISTON EXPANSION CHAMBER ENGINE

Francis W. Jackson, 409 Penwyn Rd., Wynnewood, Pa. 19096

Filed Dec. 2, 1981, Ser. No. 326,902
Int. Cl.³ F02B 75/18
U.S. Cl. 123—52 B **1 Claim**



1. A four cycle internal combustion engine comprising a cylinder with an auxiliary piston reciprocating in the cylinder and a working piston reciprocating within the auxiliary piston, an auxiliary chamber above said auxiliary piston, a combustion chamber above said working piston, means controlling communication of said auxiliary chamber with said combustion chamber to permit communication during expansion strokes and subsequent exhaust strokes only from when both pistons are moving toward BDC until the auxiliary piston returns to TDC; wherein said controlling means comprises a projection on a top surface of said auxiliary piston adjacent said working piston to prevent communication of the respective chambers with each other when said auxiliary piston is at TDC, and means varying dwell of the auxiliary piston so that the pistons are about ninety degrees out of phase during intake and expansion strokes and substantially in phase during ends of exhaust and compression strokes.

4,489,682

LINEAR MOVEMENT MOTOR AND A SWASH PLATE FOR A MOTOR OF THIS TYPE

James E. Kenny, Nil-St-Vincent, Belgium, assignor to S.E.C.A. Société Anonyme, Societe d'Entreprises Commerciales et Aeronautiques, Brussels, Belgium

Filed Sep. 10, 1981, Ser. No. 301,039
Claims priority, application Belgium, Mar. 13, 1981, 0/204121
Int. Cl.³ F02B 75/04
U.S. Cl. 123—58 B **6 Claims**

1. An engine comprising
engine block means,
at least a pair of parallel cylinders defined in said engine block means,
each cylinder housing a different respective piston means which moves in a reciprocating, linear, and translational manner along a piston axis relative to said engine block means,
a drive shaft extending parallel to and symmetrically dis-

posed with respect to said cylinders, including bearing means journaling said drive shaft for rotational movements, said drive shaft having opposed ends, and a shaft axis,

a rigid extension means associated with each said respective piston means and extending from each said cylinder parallel to said piston axis, each said extension means terminating in a slide means which reciprocates with its associated said respective piston means relative to said engine block means,

guide means in said engine block means for said slide means,

flywheel means disposed at one of said opposed shaft ends, and

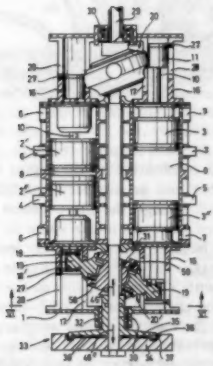
a swash plate assembly comprised of

crown means disposed in circumferential relationship to said drive shaft,

a pair of swivel joint means associated with said plate means, and each individual swivel joint means and said pair being in diametrically opposed relationship to the other thereof across said shaft axis,

each one of said swivel joint means being functionally associated with a different one of said slide means,

central casing means disposed generally transversely in said crown means and having bearing means, said bearing means mounting said central casing means for rotational movement of said central casting means relative to said crown means, said central casing means having a longitudinal axis,



said central casing means including bore means extending angularly therethrough relative to said longitudinal axis, said bore means including keying means, and

said drive shaft extending through said bore means,

said keying means cooperating with said drive shaft in a driving relationship,

said flywheel means being composed of two concentric elements, of which one such concentric element is positioned adjacent said engine block means while the other such concentric element includes a central cylindrical body which bears on said swash plate, and means is provided to vary the spacing between such two concentric elements of said flywheel,

one of said two concentric elements being attached onto said drive shaft and the other of said concentric elements being adapted to slide axially on said drive shaft, whereby a variable volumetric cavity is definable between such two concentric elements which cavity can be varied volumetrically so that the volume of a combustion chamber defined in each cylinder is variable,

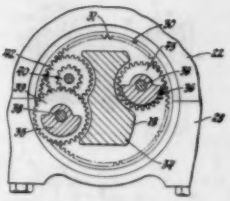
whereby rocking movements of said swash plate assembly produces rotary movement of said shaft means.

4,489,683

ENGINE WITH CRANK MOUNTED BALANCER FOR SECONDARY SHAKING FORCES

Lung-Wen Tsai, Troy, and Thomas J. Johnson, Leonard, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1982, Ser. No. 373,350
Int. Cl.³ F16F *15/26*
U.S. Cl. 123—192 B **11 Claims**



1. A multicylinder piston engine having a crankcase rotatably journaling a crankshaft therein for rotation on a longitudinal axis, said crankshaft having a plurality of axially spaced throws connectable with reciprocable pistons, associated with various engine cylinders,

an even number of balance weights of equal mass carried by said crankshaft and arranged for eccentric rotation about axes parallel with and spaced equidistant from the crankshaft axis, said balance weights being arranged in pairs having rotational axes rotatable with the crankshaft and oppositely displaced from and coplanar with one another and the crankshaft axis to provide substantial primary balance of the balance weights about the crankshaft axis and said balance weights comprising diverse first and second groups having equal numbers of weights, and

means for rotatably driving about their respective axes the weights of said first and second groups of balance weights in opposite directions of rotation at twice the crankshaft speed with respect to the crankcase, all of the weights of each group having the same eccentric orientation whereby the eccentric unbalances of said groups combine to provide a reciprocating secondary shaking force on the crankshaft for balancing opposed secondary shaking forces of equivalent value acting on the crankshaft during engine operation.

4,489,684

FUEL INJECTION PUMP ASSEMBLY

Kelichi Yamada, Ohmiya, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1982, Ser. No. 372,242
Claims priority, application Japan, May 6, 1981, 56-066858
Int. Cl.³ F02M *63/02*
U.S. Cl. 123—198 F **4 Claims**

1. A fuel injection pump assembly for an engine having a plurality of cylinders, comprising:

a pump cylinder having

a pair of fuel inlet ports,

a plurality of fuel distribution ports which are equal in number to the cylinders of the engine and which lead to the cylinders,

a pressurization chamber;

a plunger rotatably and telescopically mounted in said pump cylinder and having

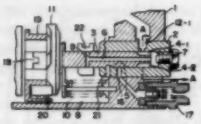
fuel supply slots for selective communication between said fuel inlet ports and said pressurization chamber, and

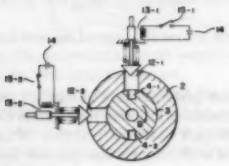
a passageway held in selective communication between said pressurization chamber and said fuel distribution ports,

said fuel supply slots being half the number of the cylinders of the engine and angularly equally spaced at a first angle,

said fuel inlet ports being angularly spaced from each other at a second angle which is equal to the product of said first angle and $(\frac{1}{2})+n$ where $n=0$ or a positive integer,

said plunger being rotatable about its own axis in response to rotation of the engine and reciprocable in strokes which are equal in number to the cylinders of the engine per rotation of the engine for selectively supplying fuel from





said fuel inlet ports through said fuel supply slots, through said pressurization chamber, and through said passageway to said fuel distribution ports; and

means for selectively opening and closing said fuel inlet ports,

whereby selected ones of the cylinders of the engine can be disabled when said fuel inlet ports are selectively closed by said means so that incomplete fuel combustion in prevented and smelly exhaust gas is reduced.

4,489,685

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

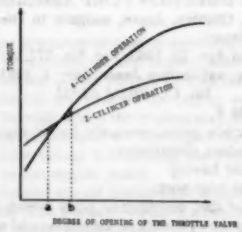
Mitsutaka Kinoshita; Tatsuro Nakagami; Nobuaki Murakami; Norio Endo; Fumio Tamura, and Yoshiaki Danno, all of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 359,864, Mar. 19, 1982, abandoned. This application May 2, 1984, Ser. No. 605,988

Claims priority, application Japan, Mar. 23, 1981, 56-40449

Int. Cl.³ F02D *13/06*

U.S. Cl. 123—198 F **6 Claims**



1. A multi-cylinder internal combustion engine comprising a plurality of cylinders which are supplied with air via one common throttle valve, an operating cylinder regulation unit which suspends the operation of an arbitrary number of cylinders by intercepting the air supply to said cylinders, a parameter detection means which detects the parameter indicating the output torque of said engine, and a control means which receives as input the result of detection of said parameter detection means and outputs a command signal to said operating cylinder regulation unit so as to shift the number of operating cylinders when said parameter coincides with a set value, which is characterized in that said set value is determined at the value of the parameter of the time when the engine output torque before and after such shift becomes substantially identical at the same degree of throttle valve opening for the switching by said regulation unit.

4,489,686

TORCH IGNITION TYPE INTERNAL COMBUSTION ENGINE

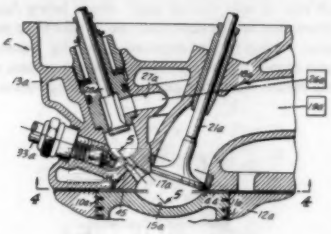
Shizuo Yagi; Isao Fujii, and Yoshio Ajiki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 14, 1982, Ser. No. 398,432

Claims priority, application Japan, Jul. 23, 1981, 56-115542; Aug. 1, 1981, 56-120828

Int. Cl.³ F02B *19/12*

U.S. Cl. 123—260 **12 Claims**



1. In an internal combustion piston engine having a main combustion chamber and an auxiliary combustion chamber connected by a torch passage, the improvement comprising, in combination: at least one main intake valve for supplying the main combustion chamber with a relatively lean air-fuel mixture, an auxiliary intake valve for supplying the auxiliary combustion chamber with a relatively rich air-fuel mixture, said auxiliary combustion chamber having a cup-shaped end spaced from and opposite the location of said auxiliary intake valve, said torch passage intersecting said auxiliary combustion chamber only at a curved portion of said cup-shaped end for communicating with said auxiliary combustion chamber, a spark plug having electrodes located in a space adjacent the said intersection between and communicating with said cup-shaped end of said auxiliary combustion chamber and said torch passage, said spark plug electrodes located outside of the torch passage for providing an unobstructed torch passage between said auxiliary combustion chamber and said main combustion chamber, the distance from the upstream end of the torch passage to said electrodes being substantially less than that to said auxiliary intake valve, at least onesuction conduit intersecting the torch passage between its ends and extending from a peripheral zone of the main combustion chamber, whereby movement of burning air-fuel mixture through the torch passage aspirates a flow of air-fuel mixture from the main combustion chamber through said suction conduit and into the torch passage.

4,489,687

PISTON HAVING FUEL DIVERTING BARRIER MEANS

John M. Bailey, Dunlap, and Dale L. Lindenfelser, Tremont, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

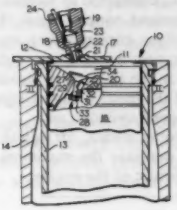
Filed Sep. 16, 1983, Ser. No. 533,039

Int. Cl.³ F02B *19/14*

U.S. Cl. 123—269 **15 Claims**

1. In an internal combustion engine having a main combustion chamber (11) partially defined by a cylinder bore (12), a

piston (16) defining a movable wall of the main combustion chamber (11), and a precombustion chamber (18) having a throat (22) through which a stream of combustible fuel and air is directed into the main combustion chamber (11) and toward



the piston for impacting thereagainst at an impact point offset from the center of the piston, the improvement comprising:

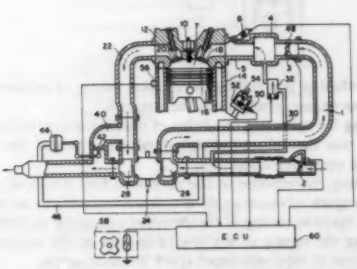
barrier means (36) for preventing unburned fuel from being deflected against a portion of the cylinder bore (12) nearest the impact point on the piston.

4,489,688

CONTROL FOR IDLE SPEED CONTROL VALVE

Yoshiyasu Ito; Toshio Suematsu; Yuji Takeda; Katsushi Anzai, all of Toyota, and Matsuji Yoshida, Ichinomiya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 20, 1983, Ser. No. 505,821
Claims priority, application Japan, Mar. 16, 1983, 58-42200
Int. Cl.³ F02M *3/00*
U.S. Cl. 123—339 6 Claims



1. A control device for an idle speed control valve for use on an engine in which a bypass path is provided parallel to an intake path portion provided with a throttle valve and the idle speed control valve is provided in the bypass path, the opening of the idle speed control valve being controlled by a control pulse signal wherein when said control pulse signal has a 0% duty ratio the idle speed control valve is caused to be fully-closed, said control device comprising:

interrupting means for interrupting the transmission of said control pulse signal to the idle speed control valve, wherein said idle speed control valve is a solenoid valve and the opening of the solenoid valve is a continuous function of input current, the input current being in the form of said control pulse signal whose duty ratio is controlled; and

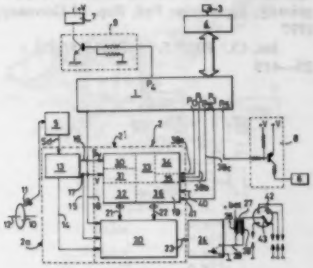
a complete closure indicating means for operating said interrupting means in order that the idle speed control valve may be fully closed.

4,489,689

DEVICE FOR CONTROLLING THE IGNITION AND FUEL INJECTION OF AN INTERNAL COMBUSTION ENGINE

Philippe Avian, Ecquevilly, and Bernard Lepretre, Boulogne Billancourt, both of France, assignors to Regie Nationale des Usines Renault, Boulogne Billancourt, France

Filed Aug. 8, 1983, Ser. No. 521,409
Claims priority, application France, Aug. 11, 1982, 82 13996
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—417 4 Claims



1. A device for controlling the ignition and fuel injection of an internal combustion engine having an intake manifold, a crankshaft, plural pistons coupled to the crankshaft, a fuel injector, and an ignition coil, comprising:

a target fixedly rotating with the crankshaft, said target having a periphery provided with a series of teeth and hollows, at least one tooth of which has been eliminated to define a predetermined absolute reference;

a single angular position sensor associated with said target;

a sensor for measuring pressure in said intake manifold of the engine;

a computation system in which are stored predetermined values of angle of advance and injection time addressable as a function of the parameters of engine speed and pressure in the intake manifold, said computation system comprising,

sensor processing means for producing from an output signal of the position sensor a synchronization signal (Sy) identifying the passage of each piston by a predetermined position and for computing engine speed,

a first microcomputer connected to the pressure sensor and controlling the injector, and

a second microcomputer connected to the position sensor and controlling the ignition coil, the second microcomputer being a dedicated ignition computer for processing said synchronization signal (Sy), an image signal (Sd) of the teeth of the target and a frequency speed signal (V) n times greater than that of the image signal (Sd) from the output signal of the position sensor, said second microcomputer including read only memory means for storing factors of correction for advance, for full load advance, and for predetermined additional inputs for correction of advance, said read only memory means of the second microcomputer containing a zero value,

said first microcomputer including means for storing the values for the angle of advance and injection time, means for receiving the synchronization signal (Sy), means for computing the engine speed and angle of advance and for applying a value of the angle of advance to the predetermined additional inputs of the second microcomputer,

said second microcomputer including means for computing the conduction angle of the coil as a function of said signals processed from the output signal of the sensor processing means, and means for controlling the conduc-

tion of said coil according to the computed angles of conduction and ignition advance.

4,489,690

APPARATUS FOR OPTIMIZING OPERATING CHARACTERISTICS OF AN INTERNAL COMBUSTION ENGINE

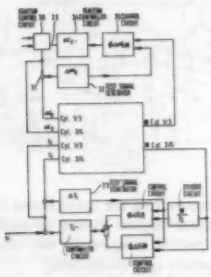
Rainer Burkel, Le Chesnay, and Cornelius Peter, Paris, both of France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 187,128, Sep. 15, 1980, abandoned. This application Oct. 14, 1982, Ser. No. 434,297

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2941977

Int. Cl.[3] **F02P** *5/04;* **F02M** *51/00*

U.S. Cl. 123—419 **1 Claim**



1. An apparatus for optimizing operating characteristics of an internal combustion engine having a plurality of operating cylinders, each supplied with an operating mixture of fuel and air and having a spark plug for igniting the mixture, which comprises:

means for generating a fuel quantity injection signal for each engine cylinder;

ignition control means for supplying ignition timing signals to each cylinder spark plug, to determine the moment of ignition in each cylinder;

first test signal generating means for generating predetermined first test signals;

first modulator means for modulating the fuel quantity injection signal for only at least one first cylinder in accordance with the first test signals, the only at least one first cylinder constituting a portion of the plurality of engine cylinders;

first torque measurement means for generating a first torque signal indicating output torque of the at least one first cylinder;

maximum torque determining means for determining the maximum output torque operating characteristic of the engine on the basis of variations in the first test signal resulting from the modulation of the fuel quantity injection signal for the at least one first cylinder and evaluation of the first torque signal;

minimum fuel consumption determining means for determining the minimum specific fuel consumption operating condition of the engine on the basis of variations in the first test signal resulting from the modulation of the fuel quantity injection signal for the at least one first cylinder and evaluation of an efficiency signal from a divider means for dividing the torque signal by the modulated fuel quantity injection signal; and

second test signal generating means for generating predetermined second test signals;

second modulator means for modulating the ignition timing signals supplied to only at least one second cylinder in accordance with the second test signals, to vary the moment of ignition of the only at least one second cylinder, which constitutes another portion of the plurality of engine cylinders;

second torque measurement means for generating a second torque signal indicating output of the at least one second cylinder;

control circuit means, connected to receive the second test signals and the second torque signal, for determining ignition signal values corresponding to the maximum output torque operating characteristic of the engine on the basis of variations in the second test signal resulting from the modulation of the ignition timing signals supplied to the at least one second cylinder; and

ignition signal controller means, for adjusting the ignition timing signals to optimize the maximum output torque operating characteristic of the engine.

4,489,691

METHOD AND APPARATUS FOR CONTROLLING THE IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

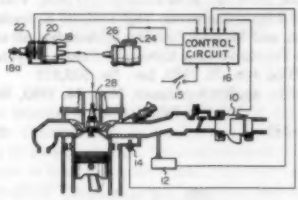
Hironobu Ono, Toyota; Jiro Nakano, Okazaki, and Masaomi Nagase, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 304,561, Sep. 22, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 551,505

Claims priority, application Japan, Sep. 25, 1980, 55-132271

Int. Cl.[3] **F02P** *5/14*

U.S. Cl. 123—424 **8 Claims**



1. A method of controlling the ignition timing of an internal combustion engine, comprising the steps of:

detecting the operating condition of the engine to produce at least one first electrical signal which indicates the detected operating condition;

calculating, in response to the produced first electrical signal, a spark advance angle which corresponds to an optimum ignition timing at the detected operating condition;

adjusting the timing of the sparks applied to the engine in response to said calculated spark advance angle;

detecting whether the engine is in the starting condition to produce a second electrical signal;

detecting, in response to said second electrical signal, whether a total number of engine revolutions after starting reaches a predetermined number, to produce a third electrical signal which indicates the detected result; and

keeping, in response to said second and third electrical signals, the timing of the sparks applied to the engine at a predetermined fixed timing when the engine is in the starting condition until a total number of engine revolutions after starting reaches a predetermined number.

5. An apparatus for controlling the ignition timing of an internal combustion engine, comprising:

means for detecting the operating condition of the engine to produce at least one first electrical signal which indicates the detected operating condition;

means for calculating, in response to the produced first electrical signal, a spark advance angle which corresponds to an optimim ignition timing at the detected operating condition;

means for adjusting the timing of the sparks applied to the engine in response to said calculated spark advance angle;

means for detecting whether the engine is in the starting condition to produce a second electrical signal;

means for detecting, in response to said second electrical signal, whether a total number of engine revolutions after starting reaches a predetermined number, to produce a third electrical signal which indicates the detected result; and

means for keeping, in response to said second and third electrical signals, the timing of the sparks applied to the engine at a predetermined fixed timing when the engine is in the starting condition until a total number of engine revolutions after starting reaches a predetermined number.

4,489,692

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH KNOCK SENSOR

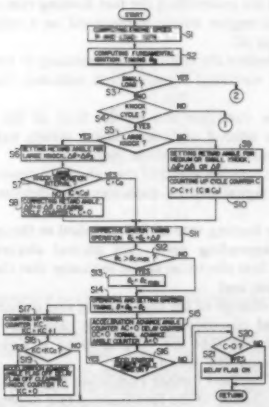
Hiroshi Haraguchi, Kariya; Kou Narita; Toshiharu Iwata, both of Aichi, and Yasutoshi Baba, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 3, 1983, Ser. No. 471,727

Claims priority, application Japan, Mar. 5, 1982, 57-35638; Mar. 8, 1982, 57-36994; Mar. 10, 1982, 57-37421

Int. Cl.³ F02P *5/14, 5/08*

U.S. Cl. 123—425 **9 Claims**



1. An ignition timing control system for an internal combustion engine comprising:

a knock sensor for detecting engine knock and providing a signal indicative of an amount of engine knock;

ignition timing control means for generating an ignition timing control signal having a timing angle that is a predetermined function of said knock signal, including means for determining the presence or absence of knock on the basis of predetermined criteria and retarding said timing angle when knock is present and advancing said timing angle when knock is absent, said ignition timing control means determining a state of the knock immediately before advancing the timing angle and controlling the rate of advance in accordance with the state of knock; and

igniter means, responsive to the ignition timing control signal, for generating an ignition signal for said engine.

4,489,693

AIR-FUEL RATIO CONTROL SYSTEM

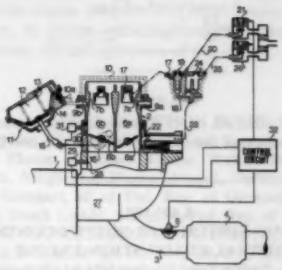
Takeshi Matsuzaki, Mitakashi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,078

Claims priority, application Japan, Nov. 10, 1982, 57-197953

Int. Cl.³ F02M *7/00*

U.S. Cl. 123—440 **3 Claims**



1. In an air-fuel ratio control system for a two-barrel carburetor of an internal combustion engine having an intake passage, two venturis in a primary side and secondary side of said carburetor, two throttle valves in said primary and secondary sides, an exhaust passage, an O_2 sensor for detecting the concentration of the constituent of exhaust gases passing through said exhaust passage, an on-off electromagnetic valve for correcting the air-fuel ratio of the air-fuel mixture supplied by an air-fuel mixture supply means, an electronic control circuit comprising a comparator for comparing an output signal of said O_2 sensor, an integrating circuit and a driving circuit for producing driving pulses for driving said electromagnetic valve in dependency on an output signal of said integrating circuit for controlling the air-fuel ratio to a value approximate to the stoichiometric air-fuel ratio, wherein the improvement comprises a vacuum operated actuator responsive to the vacuum at the venturis as an indication of the condition of operation of the internal combustion engine; a fixed signal generating circuit for supplying a rich air-fuel ratio signal to the driving circuit; and switch means adapted to be operated by vacuums in said secondary side and said intake passage so as to render the output signal of the O_2 sensor ineffective when the levels of vacuum are above predetermined levels and to supply the fixed signal to the driving circuit.

4,489,694

MODULAR FUEL INJECTION PUMPS FOR INTERNAL COMBUSTION ENGINES

Manuel Roca-Nierga, Barcelona, Spain, assignor to SPICA S.p.A., Leghorn, Italy

Filed Jun. 3, 1982, Ser. No. 384,489

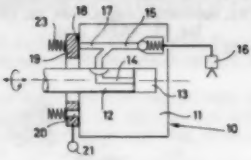
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1981, 3123095

Int. Cl.³ F02M *63/02*

U.S. Cl. 123—449 **6 Claims**

1. An injection pump for internal-combustion engines comprising a pumping unit to which a plurality of delivery conduits are associated, each feeding an injector to feed fuel to a cylinder or a plural-cylinder engine, characterized in that one or more of said conduits are associated to a valve means which slides with a planar sealing member (**19, 58**) having one or more openings (**20, 22, 60, 61**) and resilient (**23, 59**) or hydraulic biasing means, adapted to ensure a continuous contact with a coacting equally planar surface (**18**) whereon said valve means is movable and into which open one or more passageways (**17, 57**) connected to said delivery conduits, said slidable valve member (**19, 58**) being capable of taking a plurality of positions

for obstructing or, as an alternative, connecting to discharge at least one of said one or more passageways (17, 57) and each position of said plurality of positions corresponding to a differ-



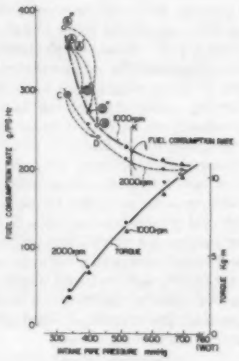
ent number of conduits or to different conduits connected to discharge to suppress the delivery sent to the corresponding injector.

4,489,695

METHOD AND SYSTEM FOR OUTPUT CONTROL OF INTERNAL COMBUSTION ENGINE

Tokio Kohama, Nishio; Seizi Huzino; Hideki Obayashi, both of Okazaki; Hisasi Kawai, Toyohashi, and Tsuneyuki Egami, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 27, 1982, Ser. No. 343,365
Claims priority, application Japan, Feb. 4, 1981, 56-15360
Int. Cl.³ F02D *17/00*
U.S. Cl. 123—481 **6 Claims**



1. A system for controlling the output of a multicylinder internal combustion engine comprising:

an intake pipe for introducing air for combustion into said internal combustion engine;

fuel supplying means for supplying fuel to said engine;

an engine speed detector for detecting the rotational speed of said engine;

signal output means for producing an output signal corresponding to a required output of said engine and an acceleration signal corresponding to the acceleration of said engine; and

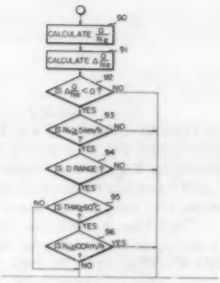
a control circuit, responsive to said detector and said signal output means, for: (1) deciding an operating condition of said internal combustion engine on the basis of the output signal from said engine speed detector and said output signal, (2) calculating and storing an optimum negative pressure of said intake pipe for said operating condition, (3) interrupting the fuel supply to at least one of said cylinders in said combustion engine to make said at least one cylinder intermittently operate thereby controlling said engine to produce a torque with said optimum negative pressure of said intake pipe being reached, and (4) disabling said interrupting function upon acceleration so that all the cylinders of said engine can operate.

4,489,696

METHOD AND APPARATUS FOR CONTROLLING THE FUEL-FEEDING RATE OF AN INTERNAL COMBUSTION ENGINE

Nobuyuki Kobayashi, Toyota; Hiroshi Itoh, Nagoya, and Takashi Hattori, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 12, 1982, Ser. No. 407,563
Claims priority, application Japan, Aug. 13, 1981, 56/125990
Int. Cl.³ F02D *5/00*
U.S. Cl. 123—493 **14 Claims**



1. A method for controlling the fuel-feeding rate of an internal combustion engine which is mounted on a vehicle, comprising the steps of:

detecting whether the engine is decelerating or not to generate a first electrical signal which indicates the detected result;

detecting the variation rate of the load of the engine to generate a second electrical signal which indicates the detected variation rate of the engine load;

detecting the running speed of the vehicle to generate a third electrical signal which indicates the detected vehicle speed;

changing the feeding rate of fuel supplied to the engine by a quantity depending upon said second electrical signal when said first electrical signal indicates that the engine is deceleration; and

stopping the change of the fuel-feeding rate depending upon said second electrical signal when said third electrical signal indicates that the vehicle-speed is slower than a predetermined low speed,

wherein said method further comprises the step of:

stopping the change of the fuel-feeding rate depending upon said second electrical signal when said third electrical signal indicates that the vehicle-speed is higher than a predetermined high speed.

4,489,697

DISTRIBUTOR TYPE FUEL INJECTION PUMP HAVING A STARTING INJECTION TIMING ADVANCE DEVICE

Hisatsugu Kawatei, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1983, Ser. No. 468,652
Int. Cl.³ F02M *59/20*
U.S. Cl. 123—502 **6 Claims**

1. In a distributor type fuel injection pump for an internal combustion engine having a housing defining therein a pressure oil chamber having an internal oil pressure variable as a function of the rotational speed of said engine, fuel injection timing control means operable in response to the oil pressure in said pressure oil chamber, and an overflow valve including a

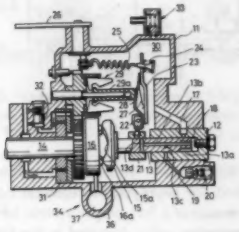
cylinder having an interior thereof communicating at one side thereof with said pressure oil chamber, and at another side with a lower pressure zone in said pump, a piston slidably received within the cylinder, and urging means urging said piston,

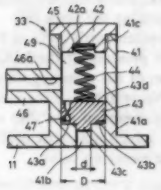
the improvement comprising:

said cylinder of said overflow valve having an end wall forming part of said housing and having a central through hole opening in said pressure oil chamber;

said overflow valve including orifice means for permitting escape of the oil pressure in said pressure oil chamber through said piston to said lower pressure zone;

said piston having one end corresponding to said one side of said cylinder and formed with a pressure applying portion having a variable pressure applying area, upon which the oil pressure in said pressure oil chamber permanently acts, said pressure applying portion of said piston comprising an end face of said one end and a protuberance formed integrally on said end face of said one end, said protuberance of said piston being adapted to be fitted into and out of said through hole formed in said cylinder, in unision with movement of said piston





responsive to changes in the oil pressure in said pressure oil chamber;

said piston having an extreme position at which said protuberance of said piston is fitted into said central through hole in said cylinder to interrupt communication between the interior of said cylinder and said pressure oil chamber, said pressure applying portion being formed by said protuberance alone and thus having a minimum pressure applying surface area when said piston is in said extreme position;

said urging means permanently urging said piston toward said extreme position thereof, said urging means having such a predetermined setting load as to keep said piston in said extreme position against the force of the oil pressure in said pressure oil chamber at the start of said engine;

said piston being adapted to be displaced away from said extreme position against said load of said urging means, as the rotational speed of said engine increases immediately after the start of the engine, so that said protuberance of said piston moves out of said central through hole formed in said cylinder to establish communication between the interior of said cylinder and said pressure oil chamber through said orifice means whereby said pressure applying portion of said piston is formed by both of said end face and said protuberance and thus has an increased pressure applying area;

whereby at the start of said engine, overflow of the pressure oil from said pressure oil chamber to said lower pressure zone through said overflow valve is prevented, to elevate the oil pressure in said pressure oil chamber and thereby obtain a required injection advance at the start of the engine by said fuel injection timing control means, whereas, during normal operation after the start of the engine, said overflow of the pressure oil is permitted, to permit obtaining ordinary injection advance during normal operation of the engine.

4,489,698

FUEL INJECTION PUMP

Gerald Höfer, Weissach-Flacht; Karl Konrath, Ludwigsburg; Franz Eheim, Stuttgart; Otmar Weiss, Stuttgart; Edgar Schmitt, Möglingen; Werner Faupel, Gerlingen, and Edgar Götz, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

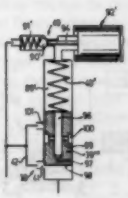
Division of Ser. No. 260,475, May 4, 1981, Pat. No. 4,395,990, which is a division of Ser. No. 844,933, Oct. 25, 1977, Pat. No. 4,273,090. This application Mar. 24, 1983, Ser. No. 478,579

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648043

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.³ F02M *59/34*

U.S. Cl. 123—502 **6 Claims**



1. In a fuel injection pump for an internal combustion engine having: a fuel sump; a housing; a working cylinder defined within the housing which receives fuel from the fuel sump; a pump piston mounted from movement within said working cylinder; drive means for effecting the movement of said pump piston; adjusting means including an adjustable piston and restoring force means, said adjustable piston being displaceable against the force of said restoring force means for adjusting said drive means and thus the movement of said pump piston; a first fuel passage leading to said fuel sump; fuel supply means for supplying fuel through said first fuel passage to said fuel sump; and pressure control means for controlling the pressure of the fuel supplied by said fuel supply means through said first fuel passage, at least in accordance with engine speed and by means of controlling the flow of a partial quantity of fuel back to said fuel supply means via a second fuel passage, said pressure control means including a movable member and a spring for exerting a closing force against said movable member, said movable member controlling said second fuel passage and being subjected to the fuel pressure in said second passage, which is exerted against said movable member in opposition to the closing force, the important comprising:

a control member; and

a temperature controlled actuating means operative at least during engine starting and until engine warm-up actuating said control member for controlling the flow of a partial quantity of fuel back to said fuel supply means, wherein;

(i) said control member and said actuating means form part of said pressure control means,

(ii) said control member comprises a pressure maintenance valve,

(iii) said pressure maintenance valve is disposed in said second fuel passage downstream of said moveable member, wherein said pressure control means comprises a pressure control valve including said movable member, and means defining a spring chamber within which said spring is mounted,

(iv) wherein said pressure control means effects a relative reduction of a total partial quantity of fuel back to said fuel supply means and a corresponding relative increase in the fuel supply pressure in said fuel sump, and

(v) said movable member is provided with a bore with a throttle portion connecting a portion of the second fuel passage upstream of said movable member with said spring chamber, said throttle portion having a connection back to said fuel supply means which is controlled by said pressure maintanance valve.

4,489,699

CONTROL MECHANISM FOR SELECTIVELY OPERATING AN INTERNAL COMBUSTION ENGINE ON TWO FUELS

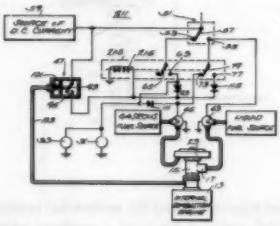
Arthur G. Poehlman, West Bend, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 314,225, Oct. 23, 1981, Pat. No. 4,393,848. This application May 10, 1982, Ser. No. 376,399

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.[3] **F02M** *21/02*

U.S. Cl. 123—525 **37 Claims**



1. Apparatus for controlling operation of an internal combustion engine which includes an intake manifold and which is selectively operable using gaseous fuel or liquid fuel, said apparatus comprising a gaseous fuel supply line extending between the engine and a source of gaseous fuel, a liquid fuel supply line extending between the engine and a source of liquid fuel, and means for controlling supply to the engine of the gaseous fuel and the liquid fuel, said control means including an operator controlled fuel selector switch comprising a first switch element connected to a source of electrical current and movable between a gaseous fuel position and a liquid fuel position, said control means being operable following prior engine operation with gaseous fuel and in response to movement of said fuel selector switch from said gaseous fuel position to said liquid fuel position for permitting liquid fuel flow through said liquid fuel supply line, for permitting continued gaseous fuel flow through said gaseous fuel supply line until initiation of liquid fuel combustion, and thereafter preventing further gaseous fuel flow through said gaseous fuel supply line until repositioning of said fuel selector switch to said gaseous fuel position, said control means also being operable following prior engine operation with liquid fuel and in response to movement of said fuel selector switch from said liquid fuel position to said gaseous fuel position for preventing further liquid fuel flow through said liquid fuel supply line, for preventing gaseous fuel flow through said gaseous fuel supply line until termination of liquid fuel combustion, and for thereafter permitting gaseous fuel flow through said gaseous fuel supply line until repositioning of said fuel selector switch to said liquid fuel position.

4,489,700

METHOD FOR SUPPLYING AN INTERNAL COMBUSTION ENGINE WITH FUEL AND A FUEL SUPPLY SYSTEM FOR PERFORMING THE METHOD

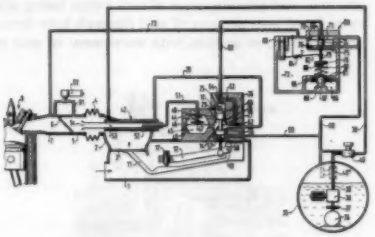
Jouke van der Weide, Rijswijk, Netherlands, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 21, 1982, Ser. No. 420,974

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204752

Int. Cl.[3] **F02M** *39/00*

U.S. Cl. 123—527 **32 Claims**



1. A method for supplying an internal combustion engine with fuel by means of a fuel supply system having a fuel supply line, a fuel metering valve disposed in the fuel supply line for metering a quantity of fuel as a function of operating characteristics of the engine, and a heat exchanger disposed in the fuel supply line, comprising the steps of:

providing the system with LPG as fuel;

maintaining the pressure of the LPG above its vapor pressure upstream of the metering valve; and

cooling the LPG upstream of the metering valve in the heat exchanger by means of the LPG metered at the fuel metering valve, which is at least partially evaporated downstream of the metering valve.

4,489,701

METHOD AND FUEL SUPPLY SYSTEM FOR FUEL SUPPLY TO A MIXTURE-COMPRESSING INTERNAL COMBUSTION ENGINE WITH EXTERNALLY SUPPLIED ENGINE

Nikolaus Simon, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 397,967, Jul. 14, 1982, abandoned. This application Jun. 5, 1984, Ser. No. 616,798

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135817

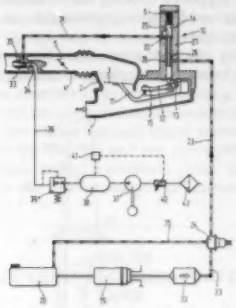
Int. Cl.[3] **F02M** *17/00, 23/00*

U.S. Cl. 123—531 **12 Claims**

1. A method for feeding a fuel supply into an intake tube of a mixture-compressing internal combustion engine having externally supplied ignition, with fuel metering at a fuel metering valve and with the supply of fuel, mixed with air, comprising

delivering fuel into a fuel nozzle disposed within said intake tube, said fuel being delivered to said nozzle at a point of least cross section which forms the throat area of said nozzle and therefrom into said intake tube, and feeding air from a compressed air source in proximity to said nozzle upstream from said nozzle area of least cross section, and through said throat area, whereby the compressed air is

provided at a pressure and the throat area of least cross section is configured such that said compressed air flows



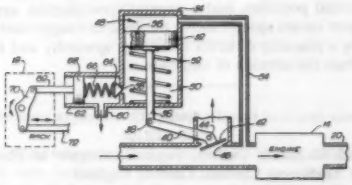
through said throat area at a velocity which is equal to or greater than the speed of sound.

4,489,702

SUPERCHARGED DIESEL ENGINE AIR FLOW CONTROL SYSTEM

Robert L. Cholvin, Santa Monica; Charles E. McInerney, Rolling Hills Estates; James N. Nancarrow, Torrance, and Jack L. Gantz, Marina Del Ray, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Sep. 27, 1982, Ser. No. 424,205
Int. Cl.³ F02D *23/00*
U.S. Cl. 123—564 **11 Claims**



1. An air inflow control system for a diesel engine system including means for supplying pressurized air to an engine and means for supplying fuel to the engine, comprising:

a relief valve movable to adjust engine air inflow;

a force-biased control member responsive to the pressure of air supplied to the engine and operably coupled to modulate the position of said relief valve in response thereto, said force-biased control member comprising a housing, a piston member cooperating with said housing to define a first pressure chamber, an actuator rod coupled between said piston member and said relief valve, means for coupling the pressure of air supplied to the engine to said first pressure chamber to act upon said piston member, and a spring for force-biasing said piston member in a direction against the pressure in said first pressure chamber;

means for altering the force-bias on said piston member in response to fuel flow to the engine wherein said force-bias altering means comprises means for moving said relief valve toward a fully open position in response to decreasing fuel flow to the engine; and

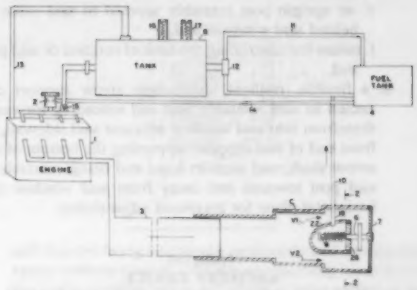
an engine air inflow conduit for passage of air to the engine, wherein said relief valve is movable to open and close a relief port formed in said engine air inflow conduit, and wherein said spring force-biases said piston member to move said relief valve toward a fully closed position during periods of increasing air pressure within the engine air inflow conduit.

4,489,703

ANTI-SMOG MEANS

Joseph S. Falzone, 62 Crescent Ct., Old Bethpage, N.Y. 11804

Continuation-in-part of Ser. No. 284,480, Jul. 17, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 451,243
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—568 **7 Claims**



1. Anti-smog means for internal combustion engines of the type having a fuel intake channel and an exhaust pipe,

pickup means connected to said exhaust pipe,

a tank connected to said pickup means,

means connecting said intake channel to said tank to feed unburnt hydrocarbons from the pickup to the fuel intake channel,

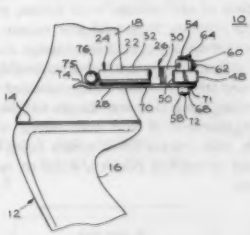
and means in the pickup means to facilitate separating unburnt hydrocarbons from water and solid particles in the engine exhaust, wherein the means to facilitate separating unburnt hydrocarbons from water and solid particles comprises an air foil shaped curved box mounted along the central axis of the exhaust pipe.

4,489,704

ARCHERY BOW WITH ADJUSTABLE ARROW SUPPORT

Fernando Troncoso, Jr., 14090-6100 Rd., Montrose, Colo. 81401

Filed Apr. 28, 1983, Ser. No. 489,694
Int. Cl.³ F41B *5/00*
U.S. Cl. 124—24 R **11 Claims**



1. An improved archery bow assembly, said assembly comprising, in combination:

A. an archery bow having a body including an arrow shelf and sidewall defining an arrow window;

B. an archery arrow having a shaft; and,

C. an improved arrow rest disposed in and behind said window and supporting said arrow in said window for shooting from said bow, said rest including

i. a mounting bracket comprising

a. an elongated mounting arm,

b. mounting means rigidly securing said arm at a plurality of spaced points to the sidewall of said bow on the

side thereof opposite said window, said arm extending horizontally rearwardly to a location immediately behind said bow body,

c. a cross bar having a slot extending longitudinally therein,

d. means releasably and adjustably securing said cross bar to the rear portion of said mounting arm through said slot,

e. an upright post rotatably secured to said cross bar behind said window; and,

f. means for controlling the limit of rotation of said post, and,

ii. a flexible, resilient, depressible arrow support connected to said rotatable post and extending forwardly therefrom into said window adjacent said sidewall, the front end of said support supporting the bottom of said arrow shaft, said support front end being rotatable by said post towards and away from said window in a horizontal plane for maximum adjustability.

4,489,705

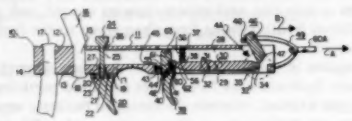
ARCHERY DEVICE

Marlow W. Larson, 2735 So. 4050 W., Ogden, Utah 84401

Filed Dec. 3, 1979, Ser. No. 99,666

Int. Cl.³ F41B 5/00

U.S. Cl. 124—35 A **11 Claims**



1. An archery bowstring draw and release device including, in combination: a first member provided with a rearwardly disposed handloop and a forwardly disposed bowstring loop; release lever means pivoted to said first member proximate said bowstring loop, having a lower end projection providing an exterior surface thereat, and constructed for releasably retentively receiving said bowstring loop, spring-biased sear means pivoted to said first member rearwardly of said release lever means, said sear means being provided with a pivoted freely-revolvable roller selectively retentively rollingly engaging said exterior surface of said release lever means; and spring-biased trigger means separate from said sear means, pivoted to said first member rearwardly of said sear means, and provided with a notch for selectively, retentively, receivably engaging said sear means, said trigger means being provided with adjustment screw means engaging said sear means for predetermining the extent of engagement of said sear means with said trigger means notch, said release lever means being constructed for return thereof to cocked position prior to recocking of said trigger means.

4,489,706

MULTI-PURPOSE FUEL EFFICIENT PORTABLE STOVE/HEATER

Paul W. Hait, Los Gatos, Calif., assignor to Pyromid, Inc., Saratoga, Calif.

Continuation-in-part of Ser. No. 296,879, Aug. 27, 1981, abandoned. This application May 14, 1982, Ser. No. 378,111

Int. Cl.³ F24C 1/16

U.S. Cl. 126—9 R **27 Claims**

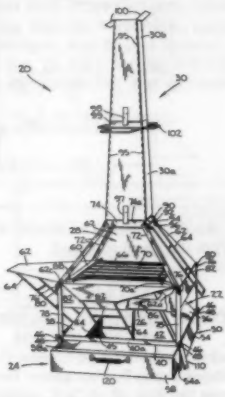
1. A portable collapsible multi-purpose stove/heater assembly comprising:

(a) a firebox in the shape of a truncated pyramid, said firebox formed by an assembly of four trapezoidal-shaped and substantially flat side panels all of which slant inwardly to form a rectangular opening at the top of the firebox, said opening located centrally above the base of said pyramid;

(b) means to secure the side panels together;

(c) means to support a cooking utensil above the rectangular opening formed by the assembled side panels at the top of the firebox; and

(d) a cooking chamber supported above the firebox, said cooking chamber comprising a rectangular-shaped and



generally flat base with a central opening generally corresponding to the rectangular opening at the top of the fire box, four trapezoidal-shaped and substantially flat side panels supportable on said base for pivotal movement with respect thereto between generally upstanding and horizontal positions, and a generally rectangular upper support means spaced above the base and supported thereon by a plurality of struts extending upwardly and inwardly from the corners of said base.

4,489,707

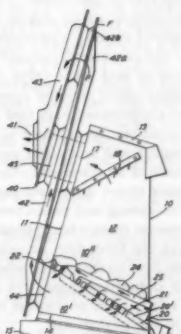
GAS FIRES

Kenneth G. Smith, Cuffley, England, assignor to Thorn EMI Gas Appliances Limited, London, England

Filed Oct. 4, 1983, Ser. No. 538,899

Int. Cl.³ F24C 3/00

U.S. Cl. 126—127 **4 Claims**



1. An apparatus for a gas fire comprising:

a combustion chamber,

a fire bed, of a refractory material, dividing said combustion

chamber into an upper portion and a lower portion and being provided with a plurality of openings interconnecting said portions,

a gas burner for directing a flame at or along the upper surface of the fire bed to cause heating thereof,

a simulated fuel mounted on the fire bed,

and a heat exchanger coupling said lower portion of the combustion chamber to an outlet opening, connectable to a flue, so that, in use, combustion products generated by the burner are drawn into said lower portion through said openings in the fire bed and are conveyed to said outlet opening, heat being transferred from the combustion products by the heat exchanger to the surrounding environment.

4,489,708

HEATING APPARATUS FOR HEATING LIQUID IN A TANK

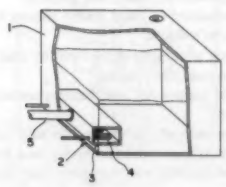
Hideo Yamamoto, Ashiya, and Seiichi Katsube, Nishinomiya, both of Japan, assignors to Kyodo Kisen Kaisha, Ltd, Kobe, Japan

Filed Apr. 13, 1983, Ser. No. 484,601

Claims priority, application Japan, Apr. 14, 1982, 57-62793; Jan. 22, 1983, 58-8931; Jan. 28, 1983, 58-13208; Feb. 7, 1983, 58-20514

Int. Cl.³ F24H *1/00*

U.S. Cl. 126—362 **5 Claims**



1. A heating apparatus for heating liquid in a tank comprising:

a hollow member disposed substantially horizontally in said tank near the bottom thereof; and

a heater housed in said hollow member and extending substantially along the entire length of said hollow member,

said hollow member including an inlet opening at the respective longitudinal ends of said hollow member so that said liquid enters said hollow member through each of said inlets,

said hollow member further including an outlet opening at the longitudinal middle of said hollow member for discharging liquid heated by said heat.

4,489,709

LOUVER SOLAR PANEL

Eric Balzer, 32594 Walker Rd., Avon Lake, Ohio 44012

Continuation of Ser. No. 277,960, Jun. 26, 1981, Pat. No. 4,409,960. This application Apr. 8, 1983, Ser. No. 483,196

The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

Int. Cl.³ F24J *3/02*

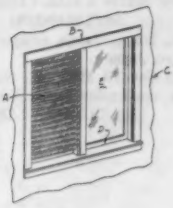
U.S. Cl. 126—417 **5 Claims**

1. A solar heating assembly suitable for mounting interiorly of a window opening, comprising:

(a) at least two vertical support members, each member including an inner edge for orientation towards a source of solar energy and an outer edge spaced therefrom, and a web section connecting said inner and outer edges;

(b) said members having vertically spaced, parallel louver receiving slots in said webs extending downwardly from said outer edges toward said inner edges, said slots opening at said outer edges and terminating short of said inner edges, and the slots of one member being is substantially parallel alignment with the slots of the other member; and,

(c) a plurality of transversely extending corrugated louvers removably supportable in said slots of the vertical members, said louvers being slidably supported in said slots,



said louvers being selectively removable and having their upper surfaces treated with a heat absorbing material and the lower surfaces being reflective of solar radiation and being corrugated transversely of their lengths to form a series of adjacent flat sections, the included angle between adjacent flat sections being substantially 90°.

4,489,710

COMPOSITION AND METHOD FOR TRANSPLANTATION THERAPY

Lynn E. Spitler, Tiburon, Calif., assignor to Xoma Corporation, San Francisco, Calif.

Division of Ser. No. 276,579, Jun. 23, 1981, abandoned. This application Oct. 18, 1982, Ser. No. 434,782

Int. Cl.³ C07G *17/00, 7/00, 11/00*; A61K *39/00*

U.S. Cl. 128—1 R **6 Claims**

1. A method of transplanting bone marrow from a donor to host comprising the steps of:

(a) removing a sample of bone marrow from the donor;

(b) incubating said sample with a composition useful in transplantation therapy which is a conjugate of a monospecific anti-mature T-cell antibody and a cytotoxin for mature T-cell to kill any mature T-cell present in said sample; and

(c) introducing said bone marrow sample into the host.

4,489,711

MAGNETIC PLASTER

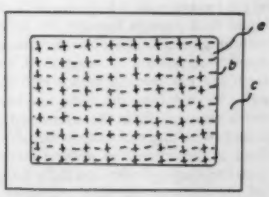
Arno W. Latzke, Wolfhalden, Switzerland, assignor to Energy-Pak, Ltd., Switzerland

Filed Mar. 1, 1982, Ser. No. 353,056

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139280; Dec. 3, 1981, 3147852

Int. Cl.³ A61N *1/40*

U.S. Cl. 128—1.3 **15 Claims**



1. A flexible, permanently magnetized plastic sheet compatible with the skin having a flux density of about 50 to 2000 Gauss, a thickness of from 0.2 to 5 mm, and which sheet has alternating positive and negative parallel magnetized strips and

side thereof opposite said window, said arm extending horizontally rearwardly to a location immediately behind said bow body,

c. a cross bar having a slot extending longitudinally therein,

d. means releasably and adjustably securing said cross bar to the rear portion of said mounting arm through said slot,

e. an upright post rotatably secured to said cross bar behind said window; and,

f. means for controlling the limit of rotation of said post, and,

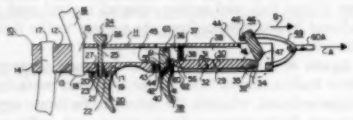
ii. a flexible, resilient, depressible arrow support connected to said rotatable post and extending forwardly therefrom into said window adjacent said sidewall, the front end of said support supporting the bottom of said arrow shaft, said support front end being rotatable by said post towards and away from said window in a horizontal plane for maximum adjustability.

4,489,705

ARCHERY DEVICE

Marlow W. Larson, 2735 So. 4050 W., Ogden, Utah 84401

Filed Dec. 3, 1979, Ser. No. 99,666
Int. Cl.³ F41B 5/00
U.S. Cl. 124—35 A **11 Claims**



1. An archery bowstring draw and release device including, in combination: a first member provided with a rearwardly disposed handloop and a forwardly disposed bowstring loop; release lever means pivoted to said first member proximate said bowstring loop, having a lower end projection providing an exterior surface thereat, and constructed for releasably retentively receiving said bowstring loop, spring-biased sear means pivoted to said first member rearwardly of said release lever means, said sear means being provided with a pivoted freely-revolvable roller selectively retentively rollingly engaging said exterior surface of said release lever means; and spring-biased trigger means separate from said sear means, pivoted to said first member rearwardly of said sear means, and provided with a notch for selectively, retentively, receivably engaging said sear means, said trigger means being provided with adjustment screw means engaging said sear means for predetermining the extent of engagement of said sear means with said trigger means notch, said release lever means being constructed for return thereof to cocked position prior to recocking of said trigger means.

4,489,706

MULTI-PURPOSE FUEL EFFICIENT PORTABLE STOVE/HEATER

Paul W. Hait, Los Gatos, Calif., assignor to Pyromid, Inc., Saratoga, Calif.

Continuation-in-part of Ser. No. 296,879, Aug. 27, 1981, abandoned. This application May 14, 1982, Ser. No. 378,111
Int. Cl.³ F24C 1/16
U.S. Cl. 126—9 R **27 Claims**

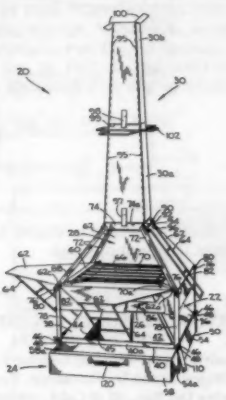
1. A portable collapsible multi-purpose stove/heater assembly comprising:

(a) a firebox in the shape of a truncated pyramid, said firebox formed by an assembly of four trapezoidal-shaped and substantially flat side panels all of which slant inwardly to form a rectangular opening at the top of the firebox, said opening located centrally above the base of said pyramid;

(b) means to secure the side panels together;

(c) means to support a cooking utensil above the rectangular opening formed by the assembled side panels at the top of the firebox; and

(d) a cooking chamber supported above the firebox, said cooking chamber comprising a rectangular-shaped and



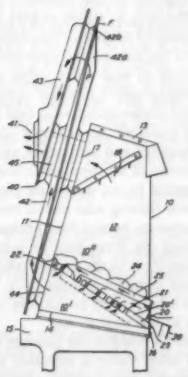
generally flat base with a central opening generally corresponding to the rectangular opening at the top of the fire box, four trapezoidal-shaped and substantially flat side panels supportable on said base for pivotal movement with respect thereto between generally upstanding and horizontal positions, and a generally rectangular upper support means spaced above the base and supported thereon by a plurality of struts extending upwardly and inwardly from the corners of said base.

4,489,707

GAS FIRES

Kenneth G. Smith, Cuffley, England, assignor to Thorn EMI Gas Appliances Limited, London, England

Filed Oct. 4, 1983, Ser. No. 538,899
Int. Cl.³ F24C 3/00
U.S. Cl. 126—127 **4 Claims**



1. An apparatus for a gas fire comprising:

a combustion chamber,

a fire bed, of a refractory material, dividing said combustion

chamber into an upper portion and a lower portion and being provided with a plurality of openings interconnecting said portions,

a gas burner for directing a flame at or along the upper surface of the fire bed to cause heating thereof,

a simulated fuel mounted on the fire bed,

and a heat exchanger coupling said lower portion of the combustion chamber to an outlet opening, connectable to a flue, so that, in use, combustion products generated by the burner are drawn into said lower portion through said openings in the fire bed and are conveyed to said outlet opening, heat being transferred from the combustion products by the heat exchanger to the surrounding environment.

4,489,708

HEATING APPARATUS FOR HEATING LIQUID IN A TANK

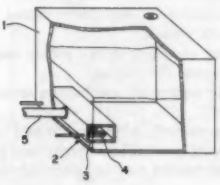
Hideo Yamamoto, Ashiya, and Seiichi Katsube, Nishinomiya, both of Japan, assignors to Kyodo Kisen Kaisha, Ltd, Kobe, Japan

Filed Apr. 13, 1983, Ser. No. 484,601

Claims priority, application Japan, Apr. 14, 1982, 57-62793; Jan. 22, 1983, 58-8931; Jan. 28, 1983, 58-13208; Feb. 7, 1983, 58-20514

Int. Cl.³ F24H *1/00*

U.S. Cl. 126—362 **5 Claims**



1. A heating apparatus for heating liquid in a tank comprising:

a hollow member disposed substantially horizontally in said tank near the bottom thereof; and

a heater housed in said hollow member and extending substantially along the entire length of said hollow member,

said hollow member including an inlet opening at the respective longitudinal ends of said hollow member so that said liquid enters said hollow member through each of said inlets,

said hollow member further including an outlet opening at the longitudinal middle of said hollow member for discharging liquid heated by said heat.

4,489,709

LOUVER SOLAR PANEL

Eric Balzer, 32594 Walker Rd., Avon Lake, Ohio 44012

Continuation of Ser. No. 277,960, Jun. 26, 1981, Pat. No. 4,409,960. This application Apr. 8, 1983, Ser. No. 483,196

The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

Int. Cl.³ F24J *3/02*

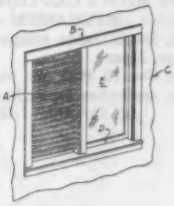
U.S. Cl. 126—417 **5 Claims**

1. A solar heating assembly suitable for mounting interiorly of a window opening, comprising:

(a) at least two vertical support members, each member including an inner edge for orientation towards a source of solar energy and an outer edge spaced therefrom, and a web section connecting said inner and outer edges;

(b) said members having vertically spaced, parallel louver receiving slots in said webs extending downwardly from said outer edges toward said inner edges, said slots opening at said outer edges and terminating short of said inner edges, and the slots of one member being is substantially parallel alignment with the slots of the other member; and,

(c) a plurality of transversely extending corrugated louvers removably supportable in said slots of the vertical members, said louvers being slidably supported in said slots,



said louvers being selectively removable and having their upper surfaces treated with a heat absorbing material and the lower surfaces being reflective of solar radiation and being corrugated transversely of their lengths to form a series of adjacent flat sections, the included angle between adjacent flat sections being substantially 90°.

4,489,710

COMPOSITION AND METHOD FOR TRANSPLANTATION THERAPY

Lynn E. Spitler, Tiburon, Calif., assignor to Xoma Corporation, San Francisco, Calif.

Division of Ser. No. 276,579, Jun. 23, 1981, abandoned. This application Oct. 18, 1982, Ser. No. 434,782

Int. Cl.³ C07G *17/00, 7/00, 11/00*; A61K *39/00*

U.S. Cl. 128—1 R **6 Claims**

1. A method of transplanting bone marrow from a donor to host comprising the steps of:

(a) removing a sample of bone marrow from the donor;

(b) incubating said sample with a composition useful in transplantation therapy which is a conjugate of a monospecific anti-mature T-cell antibody and a cytotoxin for mature T-cell to kill any mature T-cell present in said sample; and

(c) introducing said bone marrow sample into the host.

4,489,711

MAGNETIC PLASTER

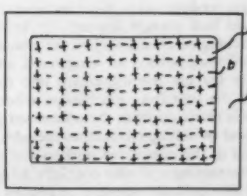
Arno W. Latzke, Wolfhalden, Switzerland, assignor to Energy-Pak, Ltd., Switzerland

Filed Mar. 1, 1982, Ser. No. 353,056

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139280; Dec. 3, 1981, 3147852

Int. Cl.³ A61N *1/40*

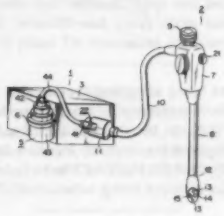
U.S. Cl. 128—1.3 **15 Claims**



1. A flexible, permanently magnetized plastic sheet compatible with the skin having a flux density of about 50 to 2000 Gauss, a thickness of from 0.2 to 5 mm, and which sheet has alternating positive and negative parallel magnetized strips and

the positive and negative poles of the strips are at distances between each other of from about 4 to 10 mm, said sheet being self adhesive to the skin or attachable to the skin by a self adhesive plaster compatible with the skin.

4,489,712
ENDOSCOPE WITH A GAS/LIQUID SWITCHING MECHANISM
Yutaka Ohshima, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Nov. 10, 1982, Ser. No. 440,579
Claims priority, application Japan, Nov. 20, 1981, 56-186246
Int. Cl.³ A61B *1/06*
U.S. Cl. 128—6 **12 Claims**



1. An endoscope capable of gas and liquid feeding operations by the use of gas feeding means and a liquid feed tank, comprising:

an endoscope body having a gas feed passage and a liquid feed passage;

a connected portion attached to the endoscope body for enabling communication with the gas feed passage and the liquid feed passage of the endoscope body;

a gas feed tube and a liquid feed tube each connected at one end to the liquid feed tank;

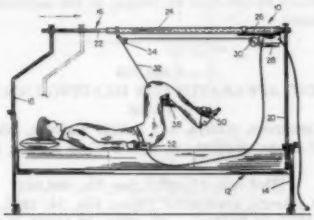
a connecting portion provided at the other ends of the gas feed tube and the liquid feed tube and capable of being attached to and detached from the connected portion of the endoscope body;

communicating means for interconnecting the gas feeding means and the gas feed passage in the endoscope body; and

a switching mechanism provided at the connected portion and capable of taking a first position in which the gas feed passage and the liquid feed passage communicate with the gas feed tube and the liquid feed tube, respectively, when the connecting portion is connected to the connected portion, and a second position in which the gas feed passage and the liquid feed passage are disconnected from the gas feed tube and the liquid feed tube, respectively, and the liquid feed passage communicates with the gas feeding means through the communicating means when the connecting portion is removed from the connected portion, wherein the interior of the liquid feed tank is pressurized by the gas feeding means and a liquid in the tank is fed into the liquid feed passage through the liquid feed tube and the switching mechanism when the connected portion and the connecting portion are connected, and wherein gas is fed from the gas feeding means into the liquid passage through the switching mechanism when the connecting portion is removed from the connected portion;

wherein said switching mechanism includes a cylinder member fixed to the connected portion and open at one end, and a connecting cylinder coaxially fixed to the opening side of the cylinder member and open at both ends, a movable member which is axially movable in the cylinder member and the connecting cylinder, and urging means for urging the movable member toward the connecting cylinder, said movable member being moved in one direction by the urging means to take said second position, and pushed by the connecting portion to move in the other direction against the urging force of the urging means to take said first position when the connecting portion is connected to the connected portion.

4,489,713
FLEXION-TRACTION BACK RELAXING SYSTEM
John F. Latenser, 604 Ridgewood Ave., Omaha, Nebr. 68114
Filed Dec. 1, 1982, Ser. No. 445,909
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—71 **7 Claims**



1. A back traction and relaxing system for use on a patient lying on a supporting surface, comprising,

a frame means positioned over the patient,

a first pulley mounted on said frame means approximately over the patient's waist,

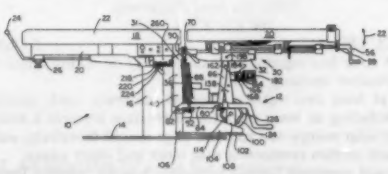
a cable extending around said first pulley and downwardly therefrom towards the patient,

a knee and ankle supporting mechanism secured to one end of said cable,

power means operatively connected to said cable for longitudinally moving said cable whereby said knee and ankle supporting mechanism may be selectively raised and lowered,

said knee and ankle supporting mechanism comprising a first transversely extending support secured at its center length to said one end of said cable adapted to be positioned beneath the patient's knees, an elongated member secured to the center length of said first support and extending therefrom towards the patient's feet, a second transversely extending support secured to said elongated member adapted to be positioned over the top of the patient's ankles whereby predetermined upward movement of said knee and ankle supporting mechanism, by said power means, will cause the patient's buttocks to be slightly raised from the supporting surface.

4,489,714
CHIROPRACTIC TREATMENT TABLE
James E. Barnes, 6734 Penmoken Dr., Fort Wayne, Ind. 46819
Filed Jan. 7, 1983, Ser. No. 456,511
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—74 **14 Claims**



12. For use in a chiropractic treatment table having a horizontally disposed upper body table section mounted on a sup-

porting pedestal for supporting the upper body portion of a patient and an anterior table section pivotably coupled to said upper body table section for flexion, an apparatus for producing a predetermined flexion movement having a starting point of said anterior body section comprising;

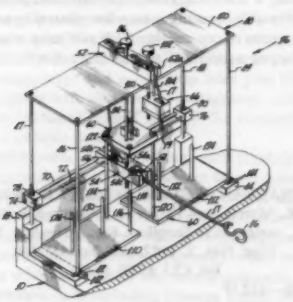
means for imparting a predetermined cyclical pattern of vertically reciprocating flexion movement to said anterior table section, and means for selecting the vertical position of said anterior section which serves as the starting point as to said cyclical pattern of flexion movement, said imparting means including means for retaining said cyclical pattern a constant irrespective of the selected starting point of said flexion movement, said predetermined movement further having a starting point from which there is flexion of given amplitude followed by plural flexions of smaller amplitude which have as an excursion reference the extremity of the first flexion, the smaller amplitude being about one-half of that of said given amplitude.

4,489,715

PORTABLE CERVICAL TRACTION APPARATUS

Donald C. Hall, 13711 Jefferson St., Westminster, Calif. 92683

Filed Aug. 16, 1982, Ser. No. 408,225
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—75 **25 Claims**



1. Cervical traction apparatus usable with a turning frame while providing transport of the patient for other treatment and diagnosis while maintaining traction, said apparatus comprising:

a generally planar, generally rigid platform of radiolucent material for receiving the patient thereon:

means on said platform for enabling the attachment thereof to a turning frame with other traction apparatus;

portable traction means mountable on said platform between the head of the patient and the adjacent end of said platform, said traction means including:

(a) a supporting framework configured for attachment to said platform without interfering with the other traction apparatus;

(b) pulley means attached to said framework;

(c) weight carrying means mounted on said framework and being configured and arranged for non-interference with the other traction apparatus, said weight carrying means being movable relative to said framework and including a pair of coplanar plate members in spaced relation with the spacing therebetween sufficient for straddling the cord of the other traction apparatus;

(d) cord means coacting with said pulley means and said weight carrying means, one end of said cord means being attachable to the traction bracket of the other traction apparatus; and

(e) fixing means for securing the other end of said cord means with said weight carrying means applying tension to said cord means and for enabling the removal of the other traction apparatus whereby said platform can be transported under traction provided by said portable traction means.

4,489,716

HYPEREXTENSION LIMITING ELBOW BRACE

Robert L. Blackwood, 1005 S. Main, Farmersville, Tex. 75031, and David M. Shapiro, 205 Washington Ave., Apt. 211, Santa Monica, Calif. 90403

Filed Nov. 7, 1983, Ser. No. 549,313
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—77 **6 Claims**

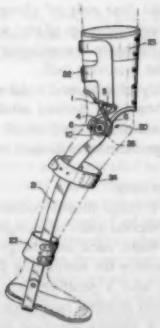
1. An elbow brace comprising: a one-piece base member of semi-stiff bendable plastic shaped to have two ends and a generally "U" shaped cross section along its length and a pre-formed bend about midway of its length thereby to conform generally to a wearer's arm partially bent at the elbow; a resilient cushion material lining the inside surface of said base member; a first pair of restraining strap members each affixed to said base member near respective ends thereof; and a second pair of restraining strap members each fastened to said base at opposite sides of the bend thereof and nearer to the bend than the first straps, with all of said restraining straps adapted to encircle the arm of a wearer and hold it firmly engaged with said brace; and wherein said first pair of restraining strap members is of flexible essentially inelastic material and said second pair of restraining strap members is of flexible elastic material.

4,489,717

DEVICE PERMITTING THE CONTROL OF THE FLEXION OF A DEFECTIVE LIMB OF A HANDICAPPED PERSON WHICH IS FITTED WITH AN ORTHOPAEDIC APPLIANCE FOR ITS SUPPORT AND ARTICULATION

Gérard Moissonnier, Le Coteau, France, assignor to Pierre Bonnabaud Sarl, Le Coteau, France

Filed Jul. 7, 1982, Ser. No. 396,114
Claims priority, application France, Jul. 20, 1981, 81 14224
Int. Cl.³ A61F *1/04*
U.S. Cl. 128—80 F **6 Claims**



1. An orthopedic appliance for fitting a defective limb of a

handicapped person which limb comprises two limb members connected by a substantially arthrodial joint comprising:

a first rigid member attachable to a first of the two limb members;

a second rigid member attachable to a second of the two limb members;

said first and second rigid members pivotally connected together by a pin with means for flexion about the axis of said arthodial joint;

a self-locking freewheel system mounted on a shaft extension of said pivot pin with said self-locking freewheel system having means for self-locking in flexion to prevent the collapse of the limb and means for allowing free extension and movement of said limb through inertia to resume a position wherein said appliance supports said limb;

said self-locking freewheel system comprising a freewheel and a hub which is force fit over said freewheel

a braking mechanism with means for acting on said hub of said self-locking freewheel system thereby preventing abrupt collapse of the limb;

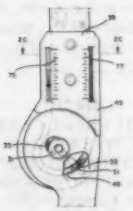
means for adjusting the amount of braking performed by said braking mechanism.

4,489,718

KNEE BRACE HINGE

Kelsey Martin, Azle, Tex., assignor to Medical Designs, Inc., Azle, Tex.

Filed Mar. 8, 1983, Ser. No. 473,229
Int. Cl.³ A61F 3/00
U.S. Cl. 128—80 C **17 Claims**



1. An external bracing apparatus for controlling the degree of motion permitted by a wearer's knee, including:

a. first and second pairs of elongate braces, with each of said braces being relatively stiff so as to resist both torsion and bending forces; said first pair of elongate braces being adapted to lie on opposite sides of the wearer's thigh and said second pair of elongate braces being adapted to lie on opposite sides of the wearer's calf;

b. means for adjustably placing and holding said respective pairs of elongate braces in desired attained positions on respective opposite sides of said thigh and calf of said wearer with a hinge means positioned correctly adjacent the wearer's knee;

the improvement comprising:

c. a pair of respective hinge means connected respectively with said first and second pairs of elongate braces at their respective central ends; each said hinge means having a single cam-slot operator for simulating flexural motion of the wearer's knee, and a positive lock for limiting the range of said flexural motion; said hinge means having a shaft contained in a mating aperture and slideably contained within a slot for allowing flexural motion simulating the motion of the wearer's knee.

4,489,719

ANKLE SUPPORT

Garry P. Lapenskie, 148 Paperbirch Crescent, London, Ontario, Canada N6G 1L7

Filed Mar. 25, 1983, Ser. No. 480,332
Int. Cl.³ A61F 13/06
U.S. Cl. 128—80 H **5 Claims**

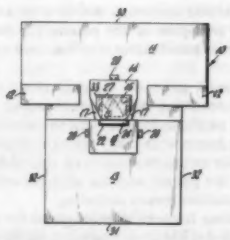
1. An ankle strap to be attached to a shoe for mitigating ankle sprains, said strap comprising an elastic body portion having outer end regions, an opening at one of said outer end regions to locate said one outer end region for attachment to the shoe in a postero-inferior position to the fifth metatarsal of a foot within the shoe, a Chicago screw for fitting through the opening and for attaching said strap to the shoe, said Chicago screw having a flattened head to avoid interfering with the foot and releasable securing means for releasably securing said outer end regions to one another with said strap attached to the shoe and looped upon itself around the ankle.

4,489,720

CESAREAN SECTION SURGICAL DRAPE

Henrietta K. Morris, and Esther R. Lagergren, both of Arlington, Tex., assignors to Surgikos, Inc., Arlington, Tex.

Filed Nov. 2, 1982, Ser. No. 438,436
Int. Cl.³ A61B 19/06
U.S. Cl. 128—132 D **7 Claims**



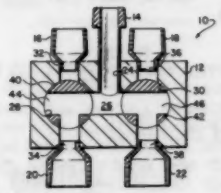
1. A surgical drape having a top edge and a bottom edge and two opposing side edges, and an upper surface and a lower surface, a fenestration through the drape in a centrally located area of the drape, a reinforcement panel around the fenestration, said reinforcement panel being attached to the upper surface of the drape along lines spaced inwardly from the side edges of the reinforcement panel to provide flexible flaps on the side edges of said reinforcement panel, an opening through the drape between the fenestration and the bottom edge of the drape, a fluidimpervious bag attached to the lower surface of the drape, an opening in said bag secured to the edges of the opening in the drape, said flexible flaps on said reinforcement panel being folded so that the lower edges of said flaps extend into the impervious bag, a second reinforcement panel which extends to the opening in the drape and over the flaps.

4,489,721

DOUBLE LUMEN TUBE ADAPTOR AND VALVE SYSTEM FOR MEDICAL ANESTHESIA CIRCUITS

George T. Ozaki; Jonathan L. Benumof, both of San Diego, and Henrik W. Andersen, Del Mar, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 30, 1982, Ser. No. 454,580
Int. Cl.³ A61M 16/00
U.S. Cl. 128—205.24 10 Claims



1. A double lumen tube adaptor and valve assembly for lung anesthesia circuits, said assembly comprising:

a housing,

a central passageway in said housing,

a pair of lateral passageways in said housing, a plurality of inlet ports in said housing including a pair of lateral ports each fluidically communicating with a separate one of said lateral passageways and a common inlet port fluidically communicating with said central passageway, each of said inlet ports including means adapted for connection to a medical anesthesia machine,

a pair of outlet ports in said housing, each fluidically communicating with a separate one of said lateral passageways and separately aligned with a separate one of said lateral inlet ports, each of said outlet ports including means adapted for connection to a patient circuit patient, and

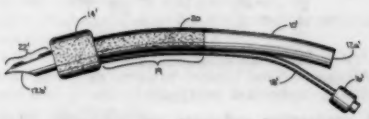
a pair of valve members rotatably mounted in said housing in alignment with said central and lateral passageways, said valve members each including passage means selectively positionable to be in alignment with said central and lateral passageways for selectively communicating certain of said inlet ports with said outlet ports, said passage means when aligned with said lateral passageways defining a straight-through passage from said lateral inlet ports to said outlet ports.

4,489,722

LASER RESISTANT ENDOTRACHEAL TUBE

Rick J. Ferraro, and Henry W. Lynch, both of Racine, Wis., assignors to Medical Engineering Corporation, Racine, Wis.

Filed Sep. 27, 1982, Ser. No. 424,753
Int. Cl.³ A61M 16/00
U.S. Cl. 128—207.15 3 Claims



1. In combination with an endotracheal tube including a fluid carrying conduit having an open proximal end an an open distal end, an elastomeric cuff attached to said tube approximate the distal end thereof and means for inflating said cuff, the improvement comprising:

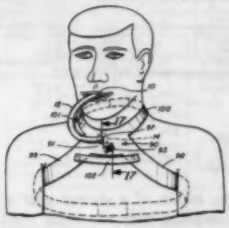
a smooth, laser-reflective coating covering both that portion of said endotracheal tube which extends from said tube cuff towards said proximal end and said cuff.

4,489,723

SWIMMING APPARATUS

Elliot Simons, 8 River View Pl., North Weymouth, Mass. 02191, and Robert Boulos, 51 Broad Reach, North Weymouth, Mass. 02190

Continuation-in-part of Ser. No. 494,710, May 16, 1983, , which is a continuation-in-part of Ser. No. 467,690, May 28, 1981, Pat. No. 4,401,118. This application Mar. 26, 1984, Ser. No. 593,363
Int. Cl.³ A61M 16/00
U.S. Cl. 128—207.16 20 Claims



18. A swimming apparatus used to enable a person having a laryngectomy or the like to safely swim, said apparatus comprising; an elongated unobstructed air tube, a mouthpiece means at one end of the air tube having an air passage communicating with the air tube to enable air passage between the air tube and the person's mouth, a relatively flat sealing member having means forming a water tight seal about the throat stoma, said sealing member also having an air passage means securing the other end of the air tube to the sealing member enabling air passage between the air tube and the person's throat, means holding the sealing member in water tight sealing relationship to the throat about the throat stoma, comprising both a fastening means coupled to the sealing member for securing the sealing member to the person and controllably inflatable air chamber means attached to the apparatus in front of and adjacent to the sealing member for maintaining the sealing member in a water tight position about the throat stoma, first valve means at the mouthpiece end of the air tube and operable during inhalation to permit air flow through the air tube to the throat stoma, and a second valve means disposed along the air tube and operable during exhalation for permitting air flow from the throat stoma therethrough.

4,489,724

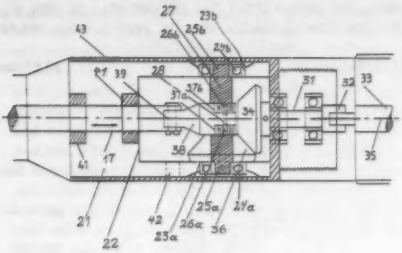
DEVICE FOR LONGITUDINALLY DRIVING A TOOL

Richard E. Arnegger, Im Schooren, 8713 Uerikon ZH, Switzerland

Continuation of Ser. No. 234,156, Feb. 13, 1981, abandoned. This application Apr. 8, 1983, Ser. No. 483,128
Claims priority, application Switzerland, Feb. 13, 1980, 1152/80
Int. Cl.³ A61B 17/14
U.S. Cl. 128—303 R 10 Claims

1. Manual device for surgical operation on bones, the device of longitudinal shape and an outer surface of cylindrical cross-section adapted to move a tool parallel to the longitudinal axis of the device, an electrical micro motor with a drive shaft and a gear section arranged between the tool and the drive shaft, characterized in that in the interior of the device there is disposed the micro motor and the drive shaft arranged coaxially to the longitudinal axis of the device; that a tool holding means adapted to removably maintain a tool is pivotally coupled with a connecting rod, the latter being pivotally coupled with two cranks, each being carried by a crankshaft and each being of cylindrical form and their axes being parallel and eccentric to a crank shaft axis common to said crankshaft; that the common crank shaft axis is perpendicular to the longitudinal axis of the device; that the crankshafts are borne in bores arranged in a

wall of the gear section and on either side of an opening in the wall of said gear section and opposite each other with respect to the longitudinal axis of the device; that the two crank shafts are coupled with the drive shaft by means of a first gear wheel having a rotational axis coinciding with the longitudinal axis of



the device and by means of a second gear wheel having a rotational axis coinciding with the crank shaft axis; that the two cranks, in the direction of the crank shaft axis, are separated from each other; that the second gear wheel is fixed with the one of the crank shafts; and that said gear section is covered by a cylindrical protective coat.

4,489,725

SEXUAL STERILIZATION DEVICES

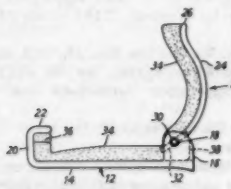
Doan Casey, Cambridge, and Gilbert M. Filshie, Nottingham, both of England, assignors to Simon Population Trust, Nottingham, England, a part interest

Filed Feb. 7, 1983, Ser. No. 464,766

Claims priority, application United Kingdom, Feb. 11, 1982, 8204011

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—346 **5 Claims**



1. A sexual sterilization device comprising a first jaw, a second jaw hingedly connected to said first jaw at a pivot, a resiliently compressible lining on said first jaw, said first and second jaws being hingeable to a clamping position for clamping a genital duct therebetween to effect the occlusion of said genital duct, said lining being in compression when said jaws are in said clamping position, and a stub attached to said second jaw and extending a distance therefrom on the opposite side of said pivot from said second jaw, said stub being engageable with said lining to resiliently bias said first and second jaws apart.

4,489,726

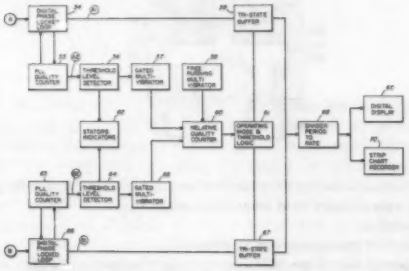
APPARATUS AND METHOD FOR QUALITATIVELY SELECTING BETWEEN SIGNALS REPRESENTATIVE OF A PHYSIOLOGICAL CHARACTERISTIC

Paul Epstein, Brookline; John S. Ballas, Jr., Newton; John J. Mandler, Jr., Allston, and Joseph M. Van Horn, Cambridge, all of Mass., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 25,720, Mar. 30, 1979, Pat. No. 4,299,234. This application Nov. 5, 1981, Ser. No. 318,339

Int. Cl.³ A61N *5/00*

U.S. Cl. 128—630 **4 Claims**



1. Apparatus for generating an output signal from a biological object comprising:

means for producing a first input signal representative of a selected physiological characteristic of said object;

means for producing a second input signal also representative of said selected physiological characteristic of said object;

means responsive to both of said input signals for producing an intermediate signal indicative of the representative quality of each input signal;

selecting means for selecting one of said two input signals in response to said intermediate signal; and

means for processing said selected signal to produce said output signal.

4,489,727

DEVICE FOR DIAGNOSING BODY CAVITY INTERIOR WITH SUPERSONIC WAVES

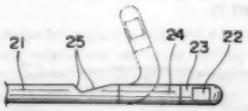
Kazumasa Matsuo, Tama, and Akio Nakada, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1982, Ser. No. 358,583

Claims priority, application Japan, Mar. 22, 1981, 56-40813; Mar. 22, 1981, 56-40814; Mar. 22, 1981, 56-40815; Mar. 22, 1981, 56-40816; Mar. 22, 1981, 56-39286

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **4 Claims**



1. A combination endoscope and supersonic diagnostic probe for examining an internal organ within a body cavity comprising:

a part adapted to be inserted into said body cavity, said inserted part including a supersonic wave probe tip positioned at its extremity, a flexible portion adjacent to said tip adjustably curvable in a locus plane of curvature, and a window for a perspective endoscope angularly incised in said inserted part above and adjacent to said flexible portion;

said supersonic wave probe tip being formed with a window for transmission of supersonic waves in a direction substantially at right angles to said locus plane of curvature and positioned where it may be brought into contact with said organ by manipulation of said flexible portion; and

said incised viewing window being so positioned that the observing direction of a perspective endoscope telescopically inserted into said inserted part will be along said locus plane of curvature whereby said supersonic wave probe tip may be observed as it is manipulated to bring said supersonic wave transmission window into contact with said organ.

4,489,728

DEVICE FOR DIAGNOSING BODY CAVITY INTERIOR WITH SUPERSONIC WAVES

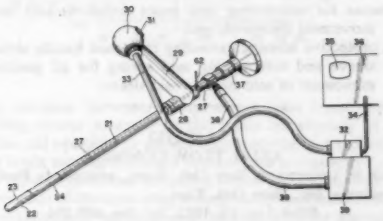
Kazumasa Matsuo, Tama, and Akio Nakada, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1982, Ser. No. 358,584

Claims priority, application Japan, Mar. 22, 1981, 56-40819; Mar. 22, 1981, 56-40820; Mar. 22, 1981, 56-40822; Mar. 22, 1981, 56-40823

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **7 Claims**



1. A device for diagnosing a body cavity interior wherein a supersonic wave probe projects supersonic waves directly into a body cavity and has means for transmitting and receiving supersonic waves to diagnose an internal organ or the like within the body cavity with the supersonic waves and an endoscope with means for projecting an illuminating light from a light source means through a flexible light guide into a body cavity to observe the interior of said body cavity, the wave probe and the endoscope form a single unit, comprising:

an elongated body having an insertable tip on one end and a viewing point on the other end thereof;

a hand piece, gripable by the operator, and having a first end attached to said body intermediate said two ends of the body and having a second end angled toward said insertable tip, such that the axis of said hand piece substantially intersects the axis of the elongated body;

a supersonic wave probe tip included in said insertable tip and containing a supersonic wave oscillator and a scanning mirror;

an electric signal cord operatively connected to said probe tip and extending into said hand piece;

a rotary shaft operatively connected with said probe tip and extending into said hand piece;

an endoscope disposed generally axially within said body, and having an eyepiece cooperatively engageable with said body at said viewing point, said endoscope extending to said insertable tip;

driving means separate from said body for driving the oscillator and scanning mirror, said driving means being connected by a flexible cable with said hand piece and operatively connected with said electrical signal cord and said rotary shaft, said flexible cable further having a cable connector at each end thereof, said hand piece having a connector compatible with one of said two cable connectors and said driving means having a connector compatible with the other of said two cable connectors, each connector and cable connector containing connections representing said rotary shaft and said electric signal cord.

4,489,729

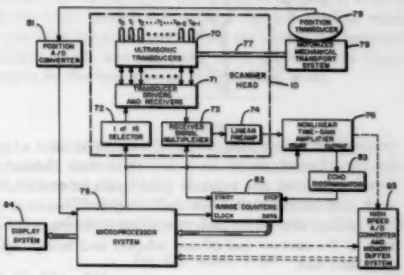
ULTRASOUND IMAGING SYSTEM

Paul D. Sorenson, Blaine, and Larry A. McNichols, Coon Rapids, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 3, 1982, Ser. No. 415,043

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **8 Claims**



1. An ultrasound imaging system comprising:

a plurality of ultrasound transducers for generating an ultrasound signal, for receiving an ultrasound signal, and for producing a transducer signal representative of said received signal;

means for providing a range signal representative of the distance of object interacting with each ultrasound signal;

timing means for producing a timing signal;

means for energizing said transducers;

means for listening for an ultrasonic wave being received at one of said transducers and for producing a stop signal indicative of each ultrasound wave being received;

sequencing means responsive to said timing signal and electrically connected to said means for energizing and said means for listening for selecting a sequence of firing transducers, for causing said means for energizing to fire a selected firing transducer at first determined time, for selecting a sequence of listening transducers and for causing said means for listening to listen to the listening transducers of the sequence during second determined times, said sequencing means also responsive to said stop signal for selecting the next in the sequence of firing transducers whenever said stop signal is received until said firing and said listening sequences are completed; and

means responsive to said transducer signals and said range signal for producing an output representative of said received ultrasound signals.

4,489,730

ULTRASONIC TRANSDUCER PROBE

Masaharu Jingu, Otawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 6, 1983, Ser. No. 511,285

Claims priority, application Japan, Jul. 8, 1982, 57-104087

Int. Cl.³ A61B *10/00*

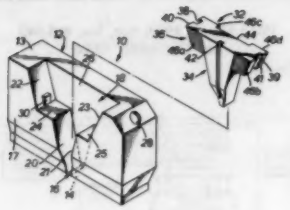
U.S. Cl. 128—660 **11 Claims**

1. An ultrasonic transducer probe for use in inserting a cannula through a region of a subject to be examined comprising:

a block-like carrier with a plurality of ultrasonic transducer elements arranged along an application surface of said carrier adapted to be positioned on the body surface of the subject, and including a wedge-shaped cavity extending

from a relatively large area in the surface opposite said application surface to a slot opening in the application surface, the inner vertical boundary of said cavity being the inner lateral wall of the carrier, and

a wedge-shaped cannula guide adapter complementary in shape to said cavity and dimensioned to removably and



securely fit within said cavity of the carrier, said adapter having channel means in a lateral surface thereof for forming at least one cannula guide path in combination with said lateral wall when said adapter is inserted into said cavity, said guide path extending from the wide surface to the narrow end of said adapter and being aligned with said slot.

4,489,731

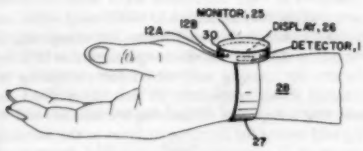
PULSE RATE MONITOR

Iosif Baumberg, Brooklyn, N.Y., assignor to H & B Technologies, Inc., New York, N.Y.

Filed Feb. 4, 1983, Ser. No. 463,815

Int. Cl.³ A61B 5/02

U.S. Cl. 128—690 **18 Claims**



1. A heart monitor comprising:

a housing adapted to be worn on a person;

a display of heart-beat data supported by said housing, said display including indicators of duration of interpulse intervals between successive beats of the heart, and counts of heart beats occurring within predetermined ranges of interpulse intervals;

the indicators of duration of interpulse intervals being located at sites corresponding to sites of the locations of the indicators of the counts of the heart beats to show symmetric and skewed distribution of interpulse intervals; and

electronic circuitry enclosed within said housing and responsive to heart beats of said person for driving said indicators, said circuitry including a detector of heart beats, means coupled to said detector for counting heart beats, means coupled to said counting means for designating a sequence of measurement intervals, and means coupled to said designating means for measuring the duration of interpulse intervals and the number of beats occurring in each of said ranges, said measuring means being coupled to said indicators.

4,489,732

GYNECOLOGICAL INSTRUMENT

Harrith M. Hasson, 2043 N. Sedgwick, Chicago, Ill. 60614

Filed Sep. 20, 1982, Ser. No. 420,404

Int. Cl.³ A61B 5/10

U.S. Cl. 128—778 **5 Claims**

1. An instrument for determining anatomical characteristics of body cavities and passageways or the like comprising

an elongated hollow sleeve adapted to be inserted in a body cavity, passageway, or the like;

expandable means at one end of said sleeve;

a handle at the other end of said sleeve;

an elongated rod slidably received within said sleeve and connected to said expandable means;

means connected to said handle for selectively sliding said rod to operate said expandable means;

a stop reciprocally mounted on said sleeve and having a stop surface facing said expandable means and adapted to engage a body surface surrounding a body cavity, passageway or the like when said sleeve is inserted thereinto;

a coil spring mounted on the exterior of and surrounding said sleeve between said stop and said handle and biasing said stop toward said expandable means;

a measuring scale mounted in fixed relation to said sleeve;

index means for indicating movement of said stop in relation to said scale;

means for connecting said index means to said stop for movement therewith; and

a protective housing extending from said handle about said sleeve and surrounding said spring for all positions of movement of said stop on said sleeve.

4,489,733

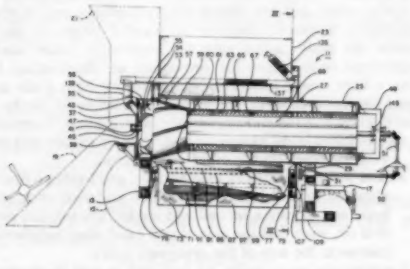
AXIAL FLOW COMBINE

Mark R. Underwood, Barr Oak, Kans., assignor to Probe Adventures, Inc., Burr Oak, Kans.

Filed Aug. 18, 1982, Ser. No. 409,294

Int. Cl.³ A01F 7/06, 12/32; A01D 67/00

U.S. Cl. 130—24 **16 Claims**



1. In a combine having a frame mounted on wheels and having a longitudinal axis, threshing means carried by the frame for receiving crop and threshing grain from the crop, the improvement comprising in combination:

a sieve housing, carried below the threshing means, having a bottom with a sloping portion that slopes transverse to the longitudinal axis, a sidewall with a window, and a channel mounted to the inner side of the sidewall below the window;

primary and secondary sieves mounted in the housing and vertically spaced apart;

shaker means for shaking the sieves to facilitate the passage of clean grain through the sieves to the sloping portion and tailings to the channel for return to the threshing means;

a blower mounted below the housing for blowing air upwardly through the sieves to discharge chaff through the window; and

the housing being carried by fore and aft rollers rotatably mounted to the housing and longitudinally spaced apart, the rollers being carried in curved guide tracks carried by the frame.

4,489,734

STRAW DISCHARGE DEFLECTORS FOR COMBINE HARVESTERS

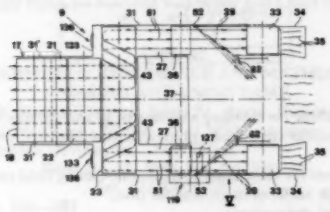
Daniël M. Van Overschelde, Roeselare, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Feb. 22, 1984, Ser. No. 582,347

Claims priority, application United Kingdom, Feb. 25, 1983, 8305259

Int. Cl.³ A01O *41/12*; A01F *12/00*

U.S. Cl. 130—27 R **10 Claims**



1. A combine harvester comprising a main frame, rotary separating means mounted on the frame transversely of the machine and operable to subject crop material to a separating action while moving it spirally therearound to respective ends of the separating means, chopping means associated with respective ends of the separating means, but spaced therefrom, so as to be capable of receiving crop material from the separating means, and deflector means pivotable about generally vertical axes and disposed between each end of the separating means and the associated chopping means, and selectively positionable so as either to allow crop material to flow to the chopping means from the separating means, or to deflect crop material inwardly of the machine for discharge from the latter in a central windrow.

4,489,735

THRESHING MACHINE

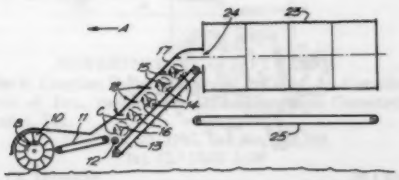
Yngve R. Akesson, Halsingborg, Sweden, assignor to Societe d'Assistance Technique pour Produits Nestle S. A., Lausanne, Switzerland

Filed Dec. 6, 1982, Ser. No. 447,163

Claims priority, application European Pat. Off., Dec. 12, 1981, 81110391.0

Int. Cl.³ A01O *45/24*

U.S. Cl. 130—30H **12 Claims**



1. A threshing machine for peas comprising a horizontal sieve drum rotatable about a longitudinal axis, containing at least two beater shafts located with their axes parallel to the longitudinal axis of the sieve drum to form several threshing areas, and a longitudinal conveyor at the inlet end of the sieve drum for throwing threshed product thereinto characterised in that a prebeater unit comprising a fixed hood and a plurality of prebeater mechanisms extends in a longitudinal direction above the longitudinal conveyor, the prebeater mechanisms being disposed above the conveyor and below said fixed hood, the prebeater mechanisms having prebeater shafts mounted laterally across the width of the longitudinal conveyor, said prebeater shafts being equipped with beater arms staggered with each other in the direction of rotation which beater arms may oscillate freely with respect to the prebeater shafts within their plane of rotation, the machine further comprising means for rotating said sieve drum, beater shafts and prebeater shafts, said rotation means being operative to rotate said prebeater shafts so that the vector of movement of the beater arms adjacent the fixed hood points toward said sieve drum, whereby the pea vines are conveyed toward the sieve drum between the prebeater shafts and the fixed hood and the peas vines are engaged by the beater arms and the fixed hood.

4,489,736

EJECTION OF FAULTY CIGARETTES

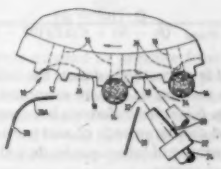
Reginald C. Bolt, High Wycombe, England, assignor to Molins PLC, London, England

Filed Nov. 24, 1982, Ser. No. 444,226

Claims priority, application United Kingdom, Dec. 1, 1981, 8136215

Int. Cl.³ A24C *5/34*

U.S. Cl. 131—282 **6 Claims**



1. Apparatus for ejecting cigarettes comprising:

a conveyor with means to carry a sideways moving row of cigarettes through an ejection station; an ejection nozzle located at said ejection station; an air deflecting surface on the conveyor associated with said means to carry a sideways moving row of cigarettes; said ejection nozzle comprising means to direct a jet of air transversely past the cigarette and onto said air deflecting surface on the conveyor which deflects the air jet onto the cigarette so as to blow the cigarette transversely off the conveyor.

4,489,737

METHOD AND APPARATUS FOR REDUCING THE MOISTURE CONTENT OF TOBACCO

Waldemar Wochnowski, Hamburg-Meiendorf, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 123,020, Feb. 20, 1980, abandoned, which is a continuation of Ser. No. 781,330, Mar. 25, 1977, abandoned, which is a continuation of Ser. No. 588,169, Jun. 18, 1975, abandoned. This application Dec. 30, 1981, Ser. No. 335,655

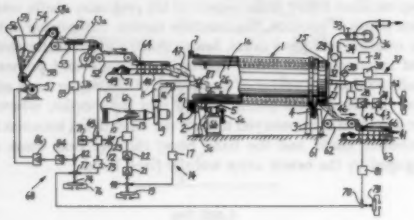
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1974, 2432848

Int. Cl.³ A24B *3/12*, *3/10*, *3/18*

U.S. Cl. 131—302 **24 Claims**

1. A method of reducing the moisture content of tobacco, comprising the steps of conveying along a predetermined path a continuous stream of moist tobacco having a varying initial moisture content; supplying to the tobacco a constant quantity of heat energy in a predetermined portion of said path so that the tobacco undergoes a heating action with attendant reduction of its moisture content; continuously measuring said initial

moisture content of tobacco upstream of said portion of said path; and changing the quantity of tobacco in said stream as a function of variations of initial moisture content so as to maintain the final moisture content of tobacco downstream of said portion of said path at an at least substantially constant value irrespective of variations of said initial moisture content and in



spite of the constancy of said supply of heat energy wherein the method further includes the step of measuring said final moisture content of tobacco downstream of said portion of said path and changing the quantity of tobacco in the stream upstream of said portion of said path when the measured final moisture content deviates from said constant value, the quantity of tobacco in said stream being equal to

$$G_t = \frac{Q \cdot (100 - fe)}{\mu_{verd.} \cdot (fa - fe) + C_t \Delta T_t (100 - fe)} \text{ kg/h}$$

wherein fa and fe respectively denote the initial and final moisture content in percent, $\mu_{verd.}$ is the evaporation and adsorption heat in kcal/kg, ΔT_t is the difference between the temperatures at the inlet and discharge ends of said portion of said path in °C., G_t is the quantity of tobacco in kg/h, and Q is said constant quantity of heat energy.

4,489,738

SELF-EXTINGUISHING CIGARETTES

Eli Simon, 7175 Little Harbor Dr., Huntington Beach, Calif. 92648

Filed Mar. 7, 1983, Ser. No. 472,955
Int. Cl.³ A24D *1/02, 1/10, 1/12*
U.S. Cl. 131—349 **6 Claims**

1. A self-extinguishing cigarette comprising a paper wrapper enclosing a charge of tobacco wherein uniformly distributed on the wrapper is an aqueous solution of a hydrophylic, film-forming adhesive selected from the group consisting of: locust bean gum, pectin, guar gum, and sodium carboxymethyl cellulose in an effective amount so as to cause said cigarette to self-extinguish when lit and left unattended.

4,489,739

SMOKABLE TOBACCO COMPOSITION AND METHOD OF MAKING

Charles F. Mattina, Jr., and William A. Selke, both of Berkshire County, Mass., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 24, 1982, Ser. No. 381,123
Int. Cl.³ A24B *15/28*
U.S. Cl. 131—352 **10 Claims**

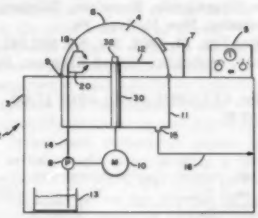
1. A shredded, smokable tobacco composition comprising about 50% to 100% by weight tobacco and having added thereto about 6.5 to about 20% based on the weight of the composition of one or more alkali-metal salts of carboxylic acids selected from the group consisting of mono-, di-, and tri-carboxylic acids having an equivalent weight less than 150 grams per equivalent, whereby said shredded smokable tobacco composition produces reduced generation of carbon monoxide upon smoking.

4,489,740

DISC CLEANING MACHINE

William D. Rattan, and Craig M. Walwyn, both of San Jose, Calif., assignors to General Signal Corporation, Stamford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,370
Int. Cl.³ G11B *3/58*
U.S. Cl. 134—140 **13 Claims**



1. A machine for cleaning a surface of an annular disc having an inner annular surface of a predetermined diameter, comprising:

a dispenser for dispensing a stream of cleaning fluid onto one or both surfaces of an annular disc,

rotational drive means,

a spindle for holding and rotating a disc through a dispensed stream of cleaning fluid, the spindle having one end rotatably fixed to the housing and the other end having a tapered surface configuration with a terminal diameter less than the diameter of the disc and gradually increasing in diameter in the direction of the rotatable end said tapered surface so configured to receive and support a disc along the inner annular surface of the disc, and

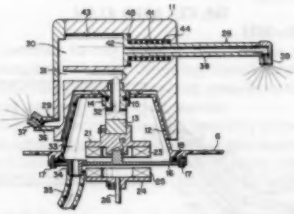
means carried on the spindle and adapted to impart the rotational movement and to direct at least a portion of the centrifugal force of the rotating spindle toward the disc for holding the disc on the spindle as the disc is rotated, impacted and cleaned with dispensed cleaning fluid.

4,489,741

WASHING APPARATUS FOR AN ENDOSCOPE

Tadahiko Ogasawara, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1983, Ser. No. 471,316
Claims priority, application Japan, Mar. 11, 1982, 57-38288
Int. Cl.³ B08B *3/04*
U.S. Cl. 134—179 **6 Claims**



1. A washing apparatus for an endoscope which sprays washing liquid thereagainst, comprising:

a housing including a washing tank;

a rotary body rotatably mounted in said washing tank, said rotary body having an inner space;

means for supplying the washing liquid into said inner space;

drive means for rotating said rotary body;

an upper nozzle including a cylindrical member provided on

said rotary body and communicating with said inner space, said cylindrical member being mounted so that it can be extended at least in part by the centrifugal force caused by the rotation of said rotary body and retracted in a substantially horizontal direction with respct to said rotary body, a sealing member for sealing said cylindrical member and said rotary body, and a nozzle tip provided on a free end of said cylindrical member and capable of spraying the washing liquid downwards, said cylindrical member being in an extended position when the washing liquid is spraying from said nozzle tip; and

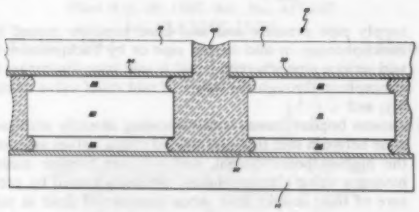
a lower nozzle provided on said rotary body and communicating with said inner space, said lower nozzle being capable of spraying the washing liquid upwards from a fixed position which is a lower part of the space of said washing tank, the fixed position being closer to said rotary body than said nozzle tip when the latter is located at the extended position of said cylindrical member, the endoscope being set between said upper and lower nozzles.

4,489,742

THERMOELECTRIC DEVICE AND METHOD OF MAKING AND USING SAME

Diane E. Moore, Clawson; Jaime M. Reyes, Birmingham, and Eugen Munteanu, Pontiac, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jul. 21, 1983, Ser. No. 516,154
Int. Cl.³ H01L *35/28*
U.S. Cl. 136—203 **38 Claims**



1. A thermoelectric unit, comprising

(a.) a thermoelectric semiconductor element;

(b.) at least one electrically conductive element;

(c.) a thermally and electrically conductive bonding structure disposed between and bonded to said thermoelectric element and to said electrically conductive element whereby the conducting element and thermoelectric element are in electrical and thermal contact, said bonding structure comprising at least 75 weight percent bismuth; and

(d.) a layer comprising at least one metal selected from the group consisting of nickel, copper and iron adhered to and interposed between said bonding structure and at least one of said elements.

4,489,743

DIFFERENTIAL GAS LIFT VALVE

Carlos R. Canalizo, Dallas, and Ernest P. Fisher, Jr., Carrollton, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Jul. 29, 1982, Ser. No. 403,285
Int. Cl.³ F04F *1/08*
U.S. Cl. 137—155 **10 Claims**

1. A gas lift valve for controlling flow of gas into a well flow conductor from the exterior thereof, comprising:

a. imperforate elongate tubular body means having a flow passage therethrough with inlet means at one end and outlet means at the other end and being connectable to a well flow conductor with said outlet means in communication with interior of said flow conductor and said inlet means in communication with the exterior of said flow conductor;

b. valve means in said tubular body having a seat surface thereon surrounding said flow passage;

c. valve closure means in said body having a seating surface thereon engageable with said seat surface on said valve seat means and longitudinally movable relative thereto between seated and unseated positions;

d. tubular valve stem means in said flow passage having one of its ends attached to said valve closure means and the

other of its ends exposed to pressure from exterior said flow conductor, said stem means having port means in its wall adjacent said valve closure means communicating the bore of said tubular stem means with the exterior thereof, the area of the valve seat subject to pressure interior of said flow conductor being greater than the area of the valve stem subject to pressure exterior of said flow conductor; and

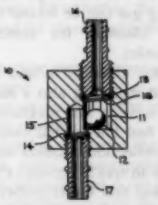
e. means biasing said valve stem means and the valve closure means attached thereto toward unseated position.

4,489,744

LIQUID BLOCKING CHECK VALVE

John T. Merrill, Pleasant Hill, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 27, 1982, Ser. No. 425,142
Int. Cl.³ F16K *31/32*
U.S. Cl. 137—202 **12 Claims**



1. A liquid blocking check valve which allows free passage of gas in opposite directions but prevents passage of liquid in one direction, comprising:

a housing defining a chamber therein, said housing being provided with a pair of apertures therein in communication with said chamber, a first of said pair of apertures being located opposite from and in an offset relation to a

second of said pair of apertures, said housing also being provided with a longitudinally extending cutaway section forming an elongation of a side wall of said chamber and adjacent said first of said pair of apertures, and

a floatable member positioned in said chamber, whereby gas and/or liquid can freely pass via said second operature through said chamber and outwardly through said cutaway section and said first aperture, and gas can freely pass backwardly through said chamber, but any liquid entering said chamber via said cutaway section causes said floatable member to move against and block said second aperture preventing passage of liquid therethrough.

4,489,745

FUEL TANK FOR USE IN A LOW-GRAVITY ENVIRONMENT

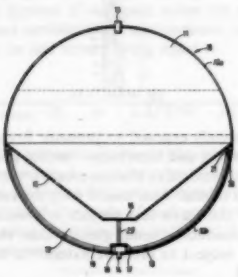
Gaston Netter, Lilienthal, and Injas Widjaja, Stuhr, both of Fed. Rep. of Germany, assignors to Erno Raumfahrttechnik GmbH/MBB, Bremen, Fed. Rep. of Germany

Filed Nov. 22, 1982, Ser. No. 443,767

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1981, 3146262

Int. Cl.³ B64G *1/00*

U.S. Cl. 137—209 **4 Claims**



1. Fuel tank for use in a satellite space vehicle or the like, i.e., for operation under low or zero gravity conditions and having a main vessel with a driving gas inlet and an opposite disposed fuel outlet, the improvement comprising:

a frusto-conical insert partitioning the vessel into a larger chamber directly communicating with the drive gas inlet and a smaller chamber communicating with the fuel outlet;

the frusto-conical partition having a small end portion constructed as a narrow, close mesh sieve, being situated close to said fuel outlet, said chambers communicating through said sieve so that fuel from the large chamber under pressure from a driving gas can be forced through the sieve into the smaller chamber for subsequent discharge through the fuel outlet;

a cylindrical collection chamber in said tank surrounding said fuel outlet and including also a narrow close mesh sieve close to said sieve of said partition; and

at least one internal fuel line in said smaller chamber and connected to said collection chamber and extending with its free end towards an area in between the wide portion of the conical insert and said vessel proper.

4,489,746

BACKFLOW PREVENTER APPARATUS

Joseph L. Daghe, Decatur; Robert E. Sands, Shelbyville, and Dennis W. Humes, Decatur, all of Ill., assignors to Mueller Co., Decatur, Ill.

Filed May 28, 1982, Ser. No. 383,305

Int. Cl.³ F16K *24/00*

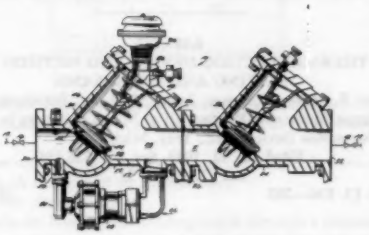
U.S. Cl. 137—218 **11 Claims**

1. A backflow preventer apparatus having an inlet adapted to be connected to a supply pipe having liquid under pressure therein and an outlet adapted to be connected to a service pipe, said backflow preventer apparatus comprising:

a body member having a flow passage therethrough;

a first check valve and a second check valve in series in said passage and defining therebetween a zone, said first check valve and said second check valve being operable to open position to permit flow of liquid from said supply pipe to said service pipe when there is a demand for liquid in said service pipe;

a differential pressure operable relief valve assembly communicating respectively with pressure of liquid in said supply pipe and in said zone between said first and second check valves, said relief valve assembly having a passage from said zone terminating in an outlet to atmosphere and having a valve therein operable to open position upon a predetermined drop in differential pressure between said



supply pipe pressure and said zone pressure caused by backsiphonage in said supply pipe or by backpressure in said service pipe whereby liquid in said zone discharges to atmosphere through the outlet of said relief valve assembly; and

a vacuum breaker means communicating directly with said zone between said first and second check valves adjacent the highest point therein, said vacuum breaker means having a valve element therein normally closed by pressure of fluid in said zone when pressure of fluid in said zone is greater than a predetermined pressure slightly above atmospheric pressure, and said valve element in said vacuum breaker means being opened completely independently of pressures of liquid in said supply pipe and said service pipe and only when pressure of fluid in said zone drops to said predetermined pressure slightly above atmospheric pressure.

4,489,747

APPARATUS FOR EXTENDING A HEADER

Ward F. Gidick, West Newton, Pa., assignor to Raymond Kaiser Engineers Inc., Oakland, Calif.

Filed May 6, 1982, Ser. No. 375,392

Int. Cl.³ F16L *31/00*

U.S. Cl. 137—315 **6 Claims**

1. An apparatus for connecting a first pipe having a terminal annular flange and a terminal closure plate fixed to said terminal annular flange to a second pipe having a terminal flange, comprising:

(a) a tube-like annular connecting wall member having an elongated transverse closure plate withdrawal aperture;

(b) first and second parallel, coaxial and longitudinally spaced radial, annular wall members each abutting the tube-like annular connecting wall at their outer peripheral edges, wherein said first radial annular wall member comprises an integral upper arcuate wall section fixed to the annular connecting wall member and a lower arcuate locking plate section releaseably connected, end to end, to said upper arcuate wall section, such that said lower arcuate locking plate section may be first removed then replaced to allow engagement of said first radial wall member with the terminal annular flange of the first pipe;

(c) a pair of parallel, longitudinally spaced panel sections perpendicular depending from said annular connection wall on opposite sides of the closure plate withdrawal aperture; and

(d) a longitudinal panel connecting wall, peripherally abutting at its ends both of said panels so as to form a closure pipe receiving chamber.

4,489,748

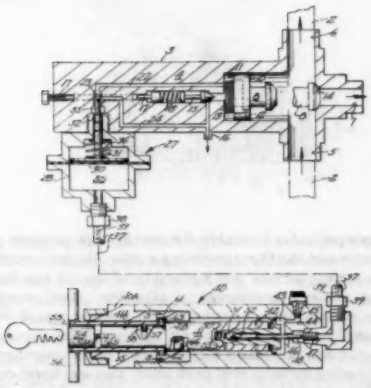
LOCKABLE APPARATUS FOR DEACTIVATING A HYDRAULIC SYSTEM

Ellis E. Fluetsch, 1291 Westview Dr., Roseburg, Oreg. 97470

Filed Sep. 29, 1982, Ser. No. 427,167

Int. Cl.³ F16K *35/00*

U.S. Cl. 137—384.4 **3 Claims**



1. A lockable apparatus for diverting pressurized hydraulic fluid from a pump output conduit of a vehicle used in earth moving operations to a hydraulic system reservoir to disable hydraulically operated components of the vehicle to prevent unauthorized vehicle operation, said appartus comprising,

a valve body including fluid inlet and outlet ports and a reservoir return port, a spring biased valve spool having front and rear faces and defining an orifice extending therebetween, said spool faces responsive to fluid pressures with the spool having a first position whereat the spool opens said reservoir return port for fluid passage through said return port to prevent hydraulic component operation and a second position whereat said reservoir return port is closed for directing pressurized hydraulic fluid to said outlet port for normal hydraulic component operation, means urging said spool to a reservoir return port closing position, check valve means in upstream fluid communication with an area partially defined by one face of said spool and in downstream communication with the system reservoir whereby closure of the check valve will cause fluid pressure increase on said one face which pressure in conjunction with said urging means relocates said spool to close said reservoir return port for normal operation of the hydraulic system components, and

check valve control means mounted on said valve body and having a first position opening the check valve to cause positioning of said spool to open the reservoir return port to divert fluid to the system reservoir to prevent operation of system hydraulic components, said control means having a second position to close the check valve to cause repositioning of said spool and closure of said return port for normal system component operation, said check valve control means including a lock on the valve body and having a plunger acting on said check valve means and enabling locking of same in said first or second position.

4,489,749

PRESSURE REGULATING DEVICE FOR GASEOUS AND LIQUID FLUIDS

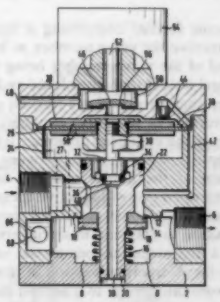
Karl Buschor; Hans Giesinger, both of St. Gall, and Kurt Moos, Wil, all of Switzerland, assignors to Ransburg-Gema AG, Switzerland

Filed Jun. 2, 1983, Ser. No. 500,325

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220815

Int. Cl.³ F16K *31/12*

U.S. Cl. 137—487.5 **12 Claims**



1. A pressure regulating device for gaseous and liquid fluids, including a housing with a pressure space, and the pressure in the pressure space is to be regulated; a fluid inlet to and an outlet from the pressure space; a main valve movable for cooperating with the housing for adjusting the flow of fluid through the pressure space and for thereby adjusting the pressure in the pressure space;

an actual pressure value measurement chamber connected to the pressure space;

an electromagnetic set-point adjuster which is adjustable for setting a desired pressure level;

a comparison device for comparing the actual pressure in the actual pressure value measurement chamber with the desired pressure set by the set-point adjuster; the comparison device being connected with the main valve for opening the main valve to increase the pressure in the pressure space when that pressure is below the desired pressure and for closing the valve to decrease the pressure in the pressure space when that pressure is above the desired pressure;

a set value transducer comprising an actual value sensor exposed to the pressure space, the transducer producing an actual value electric signal corresponding in value to the pressure then in the pressure space; a comparator for comparing the actual value signal with a predetermined

set value and for supplying a set value signal, corrected due to the comparison, to the set-point adjuster which adjusts the desired pressure.

4,489,750

PRESSURE OPERATED PULSATILE FLUID FLOW DEVICE

John R. Nehring, East Greenwich, Conn., assignor to Davol, Inc., Cranston, R.I.

Filed Aug. 25, 1981, Ser. No. 296,066
Int. Cl.³ F16K *31/12, 15/14*
U.S. Cl. 137—496 **6 Claims**

1. A fluid flow control device comprising:

a housing having an inlet, an outlet and defining a fluid flow path from the inlet to the outlet;

a flexible, resilient valve means located within the housing along the flow path for normally obstructing the flow path to preclude flow through the outlet, said valve means comprising a hollow, cylindrical resilient and flexible member having a closed end and open end, said member having greater resistance to axial collapse than to radial collapse;

said valve means further comprising a cylindrical holder adapted to receive the valve member, at least a portion of the open end of the valve member being disposed within the cylindrical holder with the closed end protruding out of the holder, thereby exposing a portion of the peripheral cylindrical surface of the valve member, at least part of that portion of the cylindrical member which is disposed within the holder effecting a seal between the inner cylindrical surface of the holder and the outer cylindrical surface of the open end of the valve member;

said valve means being constructed and arranged to shift to an open position in response to a triggering pressure differential of a first magnitude across the valve means, and to return to its obstructing position in response to a drop in said pressure differential to a second magnitude which is less than that of said first magnitude;

said valve means being constructed and arranged to define a toggle action when shifting from its obstructing to its open configuration, said toggle action being effective to substantially instantaneously shift said valve means from said obstructing to said open position;

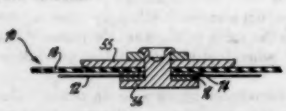
the length of the valve member being approximately double the length of the holder.

4,489,751

PRESSURE REDUCING REGULATOR FOR OXYGEN SERVICE

Byron H. Acomb, Florence, and Frank J. Gusky, Quimby, both of S.C., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 7, 1983, Ser. No. 456,444
Int. Cl.³ F16K *31/12*
U.S. Cl. 137—505.36 **4 Claims**



1. In a pressure regulator for regulating the flow of oxygen supplied to the regulator from a source of oxygen at a high inlet gas pressure comprising:

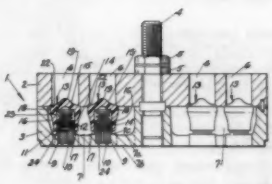
a regulator body having an inlet opening adapted to be connected to said source of high pressure oxygen; an oulet opening for discharging the oxygen at a controlled reduced pressure; a valve chamber having an upstream and downstream end relative to said flow of the oxygen; a valve assembly disposed within the valve chamber and including a slidable valve member containing a valve seat disposed at the downstream end of the valve chamber, a valve stem and a nozzle; a control chamber located in the nozzle; a bonnet having a bonnet chamber; and a diaphragm assembly having a flexible diaphragm for forming a diaphragm chamber between the bonnet chamber and the nozzle and bleed passages for controllably coupling the diaphragm chamber to the control chamber the improvement comprising: a disk like metallic shield suspended from the diaphragm in the diaphragm chamber and in close proximity to the diaphragm, said metallic shield being very thin and flexible so as not to disturb the regulating function of the regulator and having a relatively large diameter covering a substantial proportion of the diaphragm in the diaphragm chamber so as to isolate and protect the diaphragm from any hot gases or combustibles issuing from the bleed passages in response to an ignition in the regulator.

4,489,752

GUARD GUIDED MULTIPLE ELEMENT FLOW CONFIGURED POPPET VALVE

Richard M. Deminski, Mt. Vernon, Ohio, assignor to Compressor Valve Services, Inc., Mt. Vernon, Ohio

Filed Sep. 28, 1982, Ser. No. 425,559
Int. Cl.³ F16K *15/02*
U.S. Cl. 137—512.1 **1 Claim**



1. A poppet valve assembly for use in high pressure gas compressors and the like comprising a plate-like seat member having a mating surface and a plurality of spaced seat bores extending axially therethrough; a plate-like guard member having a mating surface including an annular guard bore therein configured to communicate with an outlet port, said seat member and said guard member being mated together so that said mating surfaces abut each other, said seat bores communicating with said guard bore to form a valve chamber, the peripheral opening of each seat bore adjacent said guard bore being configured to form a seating surface; a poppet element reciprocable within said valve chamber of generally cylindrical design and including an integrally formed stem portion surmounted by a head portion, said stem portion being defined by an outer convex wall surface flaring smoothly outwardly from the bottom of the stem to the beginning of the head portion, said head portion forming a fluid tight seal with said seating surface when the poppet element is in the closed position to prevent flow between the guard and seat, the bottom edge of the stem contacting the bottom surface of said guard bore to serve as a stop when the poppet element is in the fully opened position to control the opening clearance between the head and seating surface, said head portion being defined by a side wall portion adjoining said stem portion and a bell-shaped top formed by a rounded bulbous central portion flaring outwardly in a substantially concave surface to said side wall portion such that no part of the head portion overhangs the stem portion, the transition between said side wall portion and said top forming a surface configured to form a fluid tight seal

with said seating surface, said side wall being of cylindrical shape and having an outer surface substantially parallel to the longitudinal axis of the poppet element, said stem portion including a hollow cavity therewithin and spring means within said cavity for urging said poppet element to the closed position; and means for restraining said poppet element for sliding reciprocating movement within said valve chamber, said guide insert being telescopically received within said poppet element cavity to guide and restrain the element during reciprocating movement, said guide insert being at least partially hollow to form an interior cavity, said spring means being disposed within the respective interior cavities of the poppet element and guide insert, respectively.

4,489,753

STRAIGHTWAY VALVE

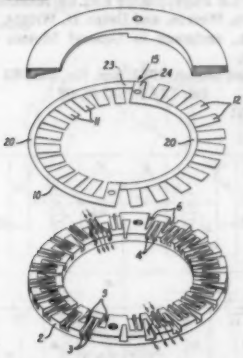
Mark I. Frenkel, ulitsa Karbysheva, 6, korpus 2, kv. 20, Leningrad, U.S.S.R.

PCT No. PCT/SU80/00159, § 371 Date May 17, 1982, § 102(e) Date May 17, 1982, PCT Pub. No. WO82/01236, PCT Pub. Date Apr. 15, 1982

PCT Filed Sep. 25, 1980, Ser. No. 385,384

Int. Cl.³ F16K *15/16*

U.S. Cl. 137—512.15 **9 Claims**



9. A straight intake-and-discharge valve for compressors and the like comprising, a plurality of rigid plates assemblable in stacked relationship defining a housing, said rigid plates each having a plurality of peripheral channels disposed extending into a body thereof defining a group of intake channels and a separate group of discharge channels, the peripheral channels extending from sides a limited extent into a body of the individual rigid plate and open to a surface of a common wall disposed when the rigid plates are stacked opposed to a next adjacent stacked rigid plate, each rigid plate having peripheral recesses extending along a wall surface disposed when in assembly with other rigid plates opposed to the surface of said common wall of the next adjacent rigid plate with said recesses in registry with the channels thereof, a plurality of valve plates having elastic teeth defining valve elements overlying the channel openings of each said common surface for opening and closing the channels by flexure in said recesses in response to fluid pressure differentials across the rigid plates and thereby said channels, backing plates to which the roots of said teeth of said valve plates are secured, and the backing plates and valve plates secured in assembly thereon are clamped at roots of said teeth between next adjacent rigid plates when in said assembly, said backing plates having a plurality of tongues extending therefrom in registry with corresponding teeth, and said tongues being arcuate in a length direction at a free end with an edge bearing on a corresponding tooth adjacent a root thereof.

4,489,754

PRESSURE RELIEF VALVE FOR CONTAINERS

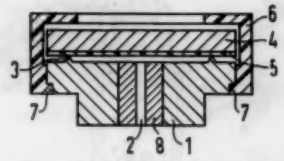
Roland Seesale, Steinheim, and Werner Maier, Königsbronn, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Anlagen Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,780

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1981, 3146030

Int. Cl.³ F16K *17/02*

U.S. Cl. 137—528 **5 Claims**



5. Pressure relief valve assembly for containers, comprising a valve including a ferro-magnetic valve body having a hole formed therein, a capillary tube disposed in said hole and extending over the entire length of said hole, and a sealing element for said hole, said sealing element being in the form of a disc-shaped permanent magnet having a side facing said hole formed in said valve body and an elastomer seal disposed on said side of said permanent magnet facing said hole, and a cap formed of synthetic material covering said valve.

4,489,755

POWER ASSISTED STEERING GEAR

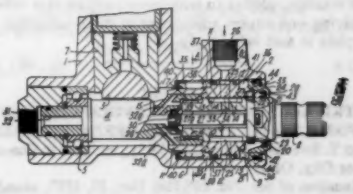
Frederick J. Adams, Clevedon, England, assignor to Cam Gears Limited, Hertfordshire, England

Filed Nov. 17, 1982, Ser. No. 442,245

Claims priority, application United Kingdom, Nov. 18, 1981, 8134709

Int. Cl.³ F15B *13/16*

U.S. Cl. 137—625.22 **12 Claims**



1. A power assisted steering gear comprising a valve housing, a valve sleeve member mounted in said housing, a valve member mounted in said valve sleeve member and displaceable relative thereto in response to a steering input, said valve sleeve member and said valve member defining control ports for controlling fluid flow to a power assisting means, said valve sleeve member having an external annular face and end faces extending radially from said annular face at axially opposite ends thereof, a first fluid chamber formed by an annular recess in said annular face, second and third fluid chambers at least partly defined by said end faces and said valve housing, one of said fluid chambers being in communication with a port in said valve housing and the two other of said fluid chambers being for communicating with respective chambers of the power assisting means, and passage means for communicating said fluid chambers with said control ports.

4,489,756

SLIDING GATE FLUID CONTROL VALVE

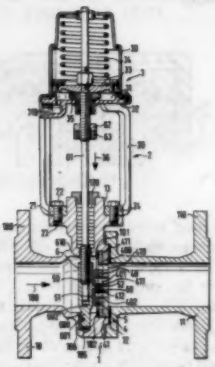
Jurgen Balz, Weissberg, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Continuation of Ser. No. 283,331, Jul. 14, 1981,. This application Jul. 5, 1983, Ser. No. 509,985

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1980, 3028435; 3028475; 3028485; Nov. 12, 1980, 3042568.

Int. Cl.³ F16K *3/30, 51/00*

U.S. Cl. 137—625.33 37 Claims



13. A valve having a valve body and a valve plate which can be moved transversely to the direction of flow through a flow passage which is to be controlled, a driving unit for moving said valve plate having a part acted upon by a control medium, a positioning-rod connecting said valve plate to said driving unit said driving unit being rotatable with respect to said valve body, means fixing said driving unit in any position of rotation, said part of said driving unit acted upon by the control medium and said valve plate being connected together by a screw connection carried by said positioning rod which alters the distance between said driving unit and valve plate, said screw connection being fixably connected to said driving unit for rotation with said driving unit, and said screw connection including a part connected to said valve body which is fixed against rotation relative to said valve body so that rotation of said driving unit causes adjustment in the positioning of said valve plate in said valve body.

4,489,757

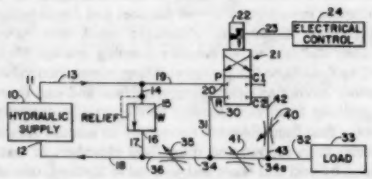
ELECTRICALLY ACTUATED SERVOCONTROL SYSTEM FOR A STATIC PRESSURE OPERATED LOAD

William T. Sweeney, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 865,086, Dec. 27, 1977, abandoned. This application Dec. 3, 1979, Ser. No. 99,950

Int. Cl.³ F15B *13/043*

U.S. Cl. 137—877 3 Claims



1. An electrically actuated servo control system for a load which requires a predictable variation in hydraulic pressure with minimal flow of hydraulic fluid comprising:

(a) a supply of hydraulic fluid under pressure, said supply having an outlet port and a return port;

(b) a load connection port means;

(c) relief means connected across said supply outlet and return ports for maintaining said supply at a constant pressure;

(d) servo control valve means having inlet and outlet hydraulic ports, and an electrical control means coupled to said servo control valve means;

(e) means for coupling the outlet port of said supply to the inlet port of said servo control valve means;

(f) flow restriction means comprising first and second flow restriction means serially connected coupling the outlet port of said servo control valve means to said supply return port; and

(g) a single hydraulic pipe for coupling said servo control valve means outlet port to said load connection port means between said first and second flow restriction means whereby the hydraulic pressure at said load connection means varies predictably with the control output to said servo control valve means without requiring but minimal flow of hydraulic fluid.

4,489,758

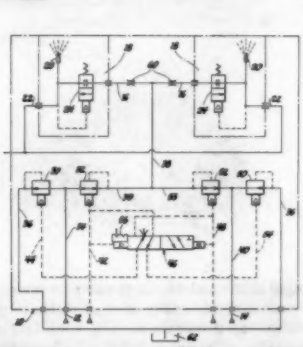
MULTIPLE FUNCTION VALVE ASSEMBLY

Antoni J. Malarz, Warren, and Dolph D. Wright, Union Lake, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 6, 1982, Ser. No. 446,983

Int. Cl.³ F16K *17/04*

U.S. Cl. 137—881 5 Claims



1. A valve assembly for selectively delivering a fluid from an input through first and second outlets and having the capability of selectively regulating outlet pressure at one outlet at a pressure determined by a pilot pressure and discharging fluid at the other outlet at a low pressure, comprising in a valve body first and second flow control valves having

(a) a common inlet chamber connected to the input, the chamber including two opposed ports defining valve seats,

(b) two poppets in the inlet chamber biased toward seating engagement with the valve seats,

(c) a diaphragm spaced from each port outboard of the inlet chamber to define an outlet chamber outboard of each port, the outlet chambers connected to the said first and second outlets respectively,

(d) a pilot cavity on one side of each diaphragm opposite the respective outlet chamber and means for admitting pilot pressure to each pilot cavity so that diaphragm deflection is a function of pilot pressure and fluid pressure in the opposing outlet chamber, and

(e) means coupling each diaphragm to a corresponding one of the poppets for movement of a poppet from its seat when the respective diaphragm deflects toward the

inlet chamber to allow fluid flow from the inlet chamber to an outlet chamber,

a restriction downstream of the first valve for maintaining a fluid pressure in the corresponding outlet chamber as a function of the pilot pressure for that valve to cause a pressure regulating action on the first valve, and

an exhaust line coupled to the second valve outlet to maintain a corresponding outlet chamber pressure lower than the pilot pressure applied to the second valve so that the second valve serves as an on-off valve in response to pilot pressure.

4,489,759

FOLDING HOSE

Michio Yamamura, Amagasaki, Japan, assignor to Tigers Polymer Corporation, Taketsuki, Japan

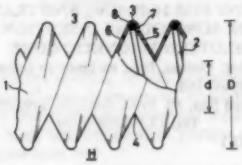
PCT No. PCT/JP79/00102, § 371 Date Jan. 2, 1980, § 102(e) Date Oct. 15, 1979, PCT Pub. No. WO79/01016, PCT Pub. Date Nov. 29, 1979

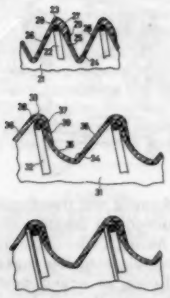
PCT Filed Apr. 23, 1979, Ser. No. 186,023

Claims priority, application Japan, May 2, 1978, 53-59940; May 25, 1978, 53-71505; Jul. 10, 1978, 53-95414

Int. Cl.³ F16L *11/00*

U.S. Cl. 138—122 **5 Claims**





1. A folding hose of the bellows-type including: hose wall of synthetic resin attached to a coil to form, in longitudinal cross-section, a series of chevrons and V-shaped valleys, said folding hose being characterized in that the modulus of elasticity in bending of the synthetic resin constituting the hose wall is in a range of 2.500 to 14.000 kg/cm², wherein on one side of each chevron, when viewing the hose in cross-section, a first hose wall shoulder is attached to said coil at a position nearer an apex of the V-shaped valley and on the other side of said chevron a second hose wall shoulder is attached to the coil at a position nearer the crest of said chevron, with this condition existing substantially throughout the whole length of said hose, said V-shaped valley being characterized by having a distinct apex formed at the intersection of the first and second walls, said apex serving as as fulcrum.

4,489,760

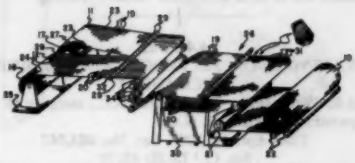
WIDE FABRIC MANUFACTURING APPARATUS

Barry W. Long, Copley, Ohio, and David H. Roush, deceased, late of Plain Township, Ohio by Vivian J. Roush, heir, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 262,196, May 11, 1981, Pat. No. 4,466,163. This application Aug. 15, 1983, Ser. No. 523,103

Int. Cl.³ D03D *41/00, 49/00*

U.S. Cl. 139—11 **10 Claims**



1. Apparatus for making a wide reinforcing fabric of treated cords by joining narrow treated fabrics of varied widths and spacing of warp cords connected by pick cords comprising a loom, a letoff for at least two of said narrow treated fabrics, separating means disposed between said loom and said letoff for separating said pick cords from said warp cords in said narrow treated fabrics, said separating means including cutting means having a plurality of circular knives mounted in side-by-side relationship at spaced-apart positions transversely of said narrow treated fabrics for cutting each of said connecting pick cords from said warp cords at a plurality of positions across said narrow treated fabrics and guide means for directing said warp cords of said narrow treated fabrics from said separating means to said loom for joining said narrow treated fabrics, means to supply a treated weft cord to said loom for weaving between said warp cords of said narrow treated fabrics to make said wide reinforcing fabric of treated cords having a width greater than the width of either of said narrow treated fabrics.

4,489,761

HAND WEAVING LOOM

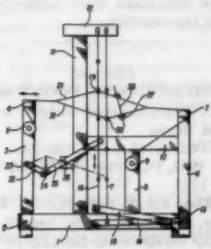
Johannes W. van Gulik, Illikhoven 12, 6116 Al Roosteren, Netherlands

Filed May 17, 1983, Ser. No. 495,484

Claims priority, application Belgium, May 19, 1982, 893.240

Int. Cl.³ D03D *29/00*

U.S. Cl. 139—29 **6 Claims**



1. A hand weaving loom for weaving warp and weft threads comprising:

a frame,

a loom beam and a breast beam mounted to said frame, said loom beam and said breast beam comprising means for tensioning all warp threads therebetween, at least one of said loom and breast beams being displaceable toward the other of said loom and breast beams,

a plurality of guide members for individually slidably receiving said warp threads,

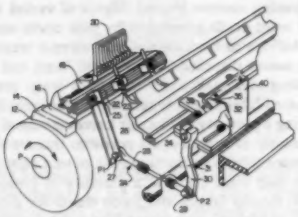
driving means for simultaneously displacing said one beam with respect to said other beam and a first group of said guide members with respect to a second group of said guide members in a direction transverse to said warp threads, wherein said first group of said guide members and said second group of said guide members move away from each other when said one beam moves toward said other beam, and wherein all said warp threads are in substantially the same plane when said loom and breast beams are at their maximum relative spacing.

4,489,762

WEAVING LOOM SELVEDGE TRIMMER DRIVE MECHANISM

Donald R. Wazenegger, Kernersville, N.C., assignor to Draper Corporation, Greensboro, N.C.

Filed Apr. 11, 1983, Ser. No. 483,547
Int. Cl.³ D03D *49/70*
U.S. Cl. 139—303 **4 Claims**



1. A selvedge trimmer for weaving looms of the type including a short sword system comprising the rocker shaft that drives the lay assembly is very close to the lay resulting in a relatively short pivot radius between the axis of rotation of the rocker shaft and the lay, said selvedge trimming mechanism is operated responlsive to reciprocal arcuate movement of the lay, said selvedge trimming mechanism comprising:

(a) a stationarily mounted cutting apparatus comprising a fixed blade and a movable blade mounted on a cutter support shaft comprising a fixed pivot point for rotation of said blade into operative engagement with said fixed blade; and

(b) linkage means consisting of said fixed pivot point and a plurality of movable pivots (P1 and 29) connecting said lay and said cutter support shaft for rotating said cutter support shaft responsive to the reciprocal arcuate movement of said lay assembly.

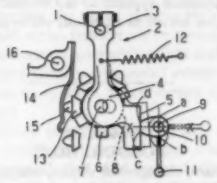
4,489,763

LEVELING DEVICE OF DOBBY MACHINE

Yasuhide Takase, Nagoya, Japan, assignor to Yamada Dobby Co., Ltd., Bisai, Japan

PCT No. PCT/JP82/00117, § 371 Date Nov. 12, 1982, § 102(e) Date Nov. 12, 1982, PCT Pub. No. WO82/03640, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 9, 1982, Ser. No. 444,893
Claims priority, application Japan, Apr. 10, 1981, 56-52260
Int. Cl.³ D03D *49/00*; D03C *1/14, 13/00*
U.S. Cl. 139—329 **7 Claims**

1. A leveling device for a dobby machine, having card cylinder bracket means pivotally attached to the machine frame, and a card cylinder mounted on said bracket means, wherein said bracket means has an operating state for positioning said card cylinder such that pegs thereon contact fish levers of the machine and a leveling state for positioning said card cylinder such that pegs thereon are not in contact with the fish levers whereby the heald frames of the machine are leveled, said leveling device comprising a shaft positioned parallel to said card cylinder; a cam means movably mounted on said shaft, said cam means having first and second cam surface portions; said bracket means including slide surface means for contacting said cam surface portions, and remaining stably in contact therewith and urging means for urging said bracket means towards said cam means, wherein when said cam means are



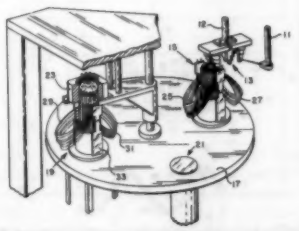
moved to a first position such that said slide surface means contacts said first cam surface portion, said bracket means are positioned in said operating state, and when said cam means are moved to a second position such that said slide surface means contacts said second cam surface portion, said bracket means are moved to said leveling state.

4,489,764

ARRANGEMENT FOR FORMING AND TRANSFERRING COILS FOR SUBSEQUENT INSERTION INTO A SLOTTED MAGNETIC CORE

Robert G. Walker, Ossian, Ind., assignor to Industra Products, Inc., Fort Wayne, Ind.

Filed Sep. 30, 1982, Ser. No. 429,323
Int. Cl.³ B21F *3/04*
U.S. Cl. 140—92.1 **44 Claims**



1. In a device for forming and transferring coils to a coil placing machine for subsequent insertion into a slotted magnetic core of the type having a wire dispensing flyer rotatable about a coil form and coil placer tooling engaging the coil form to receive the formed coils, an arrangement for maintaining formed coils in position within the coil placer tooling comprising a plurality of spring biased pins located about the periphery of the coil placer tooling for restricting unwinding of the coils while those coils reside in the coil placer tooling.

4,489,765

METHOD OF SUPPLYING A FINE-PARTICLE POWDER

Noboru Yamada, and Keisuke Yamaguchi, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1982, Ser. No. 398,204
Claims priority, application Japan, Jul. 22, 1981, 56-115553
Int. Cl.³ B65B *1/06*
U.S. Cl. 141—1 **13 Claims**

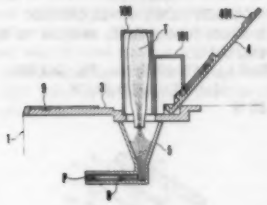
1. A method of supplying a fine-particle toner powder from a container having substantially rigid walls to a photocopying

apparatus through an opening in the photocopying apparatus, said container having an engagement portion formed in a substantially rigid wall portion thereof, the photocopying apparatus having an openable door covering said opening of said photocopying apparatus and an engagement portion adjacent to said opening, and said container being separate from said photocopying apparatus, the method comprising:

opening said openable door of said photocopying apparatus;

opening a portion of said container while said container is separated from said photocopying apparatus to expose the fine-particle toner powder in said container;

placing said opened container in an upright position on said photocopying apparatus over said opened opening of said photocopying apparatus so that said container is supported by said photocopying apparatus, said opened portion of said container being at the bottom and in registration with said opening of said photocopying apparatus so that said fine-particle toner powder can fall spontaneously



out through the opening of said container and through said opening of said photocopying apparatus;

said openable door of said photocopying apparatus including means defining said engagement portion of said photocopying apparatus; and

causing said engagement portion formed in a substantially rigid wall portion of said container to cooperatively engage with said engagement portion on said openable door of said photocopying apparatus for positively maintaining said container in a substantially stationary position supported on said photocopying apparatus by said cooperative engagement while substantially all of said fine-particle toner powder is spontaneously falling from said container into said photocopying apparatus;

thereby substantially preventing scattering and floating out of toner powder particles from said container and from said photocopying apparatus during said spontaneous falling of said fine-particle toner powder.

4,489,766

SYRINGE FILLING DEVICE

Benjamin V. Montada, 309 Louis Dr., Mississauga, Ontario, Canada L5B 1Z2

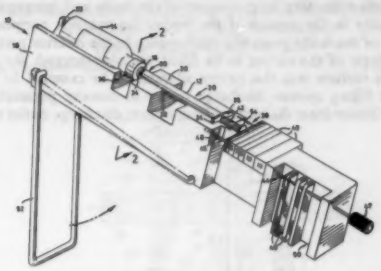
Filed Sep. 29, 1982, Ser. No. 426,760

Claims priority, application Canada, Sep. 13, 1982, 411299

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—27 **4 Claims**

1. A device for filling a syringe having a needle and an axially movable plunger, the device comprising: an elongate body having a body upper face defining a central axial syringe recess for removably positioning a syringe therein and preventing said syringe from moving axially, the body having means for exposing the needle of a syringe for insertion thereof into a medicine bottle; the upper face also having a longitudinal gage recess located adjacent to the syringe recess where the plunger of a syringe would be located, the gage recess being of a longitudinal length equal to a fully extracted syringe plunger; a plurality of spacers retractably filling said gage recess, the spacers being individually retractable to limit selectively the extraction of a syringe plunger, the spacers being of different thicknesses corresponding to preselected volumes of syringe capacity, the total thickness of said spacers being equal to the longitudinal travel of a fully extracted syringe plunger; the elongate body further including a spacer storage recess; and



means for removably retaining the spacers in said spacer storage recess.

4,489,767

APPARATUS FOR DROPPING LIQUEFIED GASES

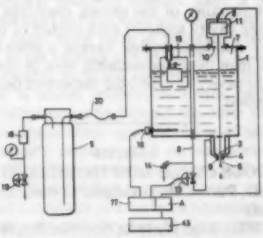
Morio Yamada, Yokohama, Japan, assignor to Toyo Seikan Kaisha, Ltd., Japan

Filed May 28, 1982, Ser. No. 383,319

Claims priority, application Japan, Sep. 8, 1981, 56-140252; Nov. 20, 1981, 56-185510

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—48 **12 Claims**



1. An apparatus for dropping liquefied inert gases into a can immediately before rolling of a canning can, comprising a storage tank for liquefied inert gases, a valve for dropping liquefied gases opened and closed by a driving device, a dropping nozzle for dropping liquefied gases from said dropping valve, a pressure regulating valve provided on a discharge route of vaporized gases above said storage tank, and a float valve adapted to open and close a liquid feed port for the liquefied gases to said storage tank.

4,489,768

DISTRIBUTION DEVICE FOR BUTTER FILLING SYSTEM

John Scoles, Reedsburg, Wis., assignor to Wisconsin Dairies Cooperative, Baraboo, Wis.

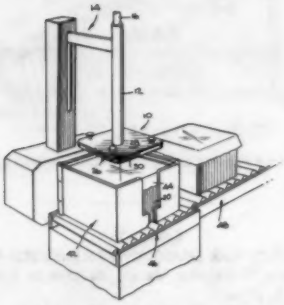
Filed Sep. 3, 1982, Ser. No. 414,855

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—71 **13 Claims**

13. A distribution device for a butter filling system which includes a discharge outlet through which pressurized fluent butter is supplied, a support structure for a carton to be filled with butter supplied from the discharge outlet and means for relatively moving at least one of the discharge outlet and the support structure towards and away from each other, the

device comprising a body of polygonal exterior peripheral shape having an upstream surface, a generally smooth downstream surface and at least one cavity disposed between the upstream and downstream surfaces formed by a plurality of channels extending from corners of the body and intersecting generally in the center of the body, the exterior peripheral shape of the body generally conforming to the interior peripheral shape of the carton to be filled, an inlet through the upstream surface into the cavity adapted to be coupled to the butter filling system discharge outlet to convey pressurized fluent butter from the butter filling system discharge outlet into



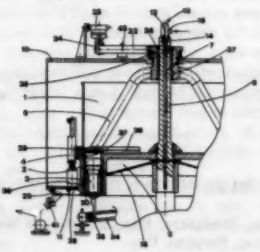
the cavity, a plurality of spaced device discharge outlets in the cavity and through the downstream surface for discharging pressurized fluent butter from the cavity into a carton to be filled at a plurality of spaced locations therein, at least one of the device discharge outlets being centrally disposed in the cavity and a plurality of the device discharge outlets being disposed in the cavity adjacent each corner of the body, each of the device discharge outlets having a cross-sectional area which is less than the cross-sectional area of the cavity at the location in the cavity at which the respective device discharge outlet is disposed.

4,489,769

CONTINUOUS-CYCLE ASEPTIC FILLING MACHINE

Camillo Catelli, Parma, Italy, assignor to Rossi & Catelli S.p.A., Parma, Italy

Filed Aug. 25, 1982, Ser. No. 381,706
Claims priority, application Italy, Jul. 16, 1981, 40077 A/81
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—91 **8 Claims**



1. Continuous-cycle aseptic filling machine comprising a filler jig; a rotatable basin having a floor; a plurality of open-topped cylinders in said floor located in direct communication therewith; a plurality of plungers respectively slidably mounted in said cylinders and designed to expel whatever substance happens to lie within said cylinders in the direction of said filler-jig; and a fixed obturator placed in direct contact with the basin-floor whereunder said cylinders are brought at regular intervals by rotation of the basin when in the process of expelling foodstuff, characterized in that it comprises:

an enclosed annular chamber located externally of said basin and affixed thereto, a shaft rotatable with said basin, an external source of sterilizer fluid, a feed conduit located coaxially within said shaft, said feed conduit communicating between said annular chamber and said external source, said chamber communicating further with a plurality of annular cavities individually located about respective outer surfaces of said plungers; and

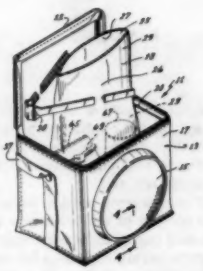
an outer casing within which marginally-pressurized sterile fluid is introduced to the end of maintaining a sterile atmosphere within said machine, the lower surface of said rotating basin constituting at least a portion of the bottom face of said casing, and rotary seals uniting said portion of the bottom face with the stationary remainder thereof.

4,489,770

WATERPROOF ENCLOSURE

Egon Reich, II, Costa Mesa, Calif., assignor to Egon Reich, Newport Beach, Calif.

Filed Apr. 11, 1983, Ser. No. 483,490
Int. Cl.³ B65D *85/38*
U.S. Cl. 150—52 R **15 Claims**



1. An essentially waterproof enclosure comprising:

an essentially waterproof container having a wall, opening means to provide access to the interior of the container and means to close the opening means so as to make the container essentially waterproof, said container being a flexible bag of essentially waterproof material;

a speaker;

means for mounting the speaker to the wall of the container for projection of sound outside of the container; and

the opening means of the container being of sufficient size to permit an electronic sound producing device to be passed through the opening means into the interior of the container so that the device can be in an essentially waterproof environment and coupled to the speaker.

4,489,771

GAS-VENTING ARRANGEMENT INCORPORATED WITH A MOLD

Takahiko Takeshima; Tadashi Ueki; Motozo Kawashima, all of Ube; Thuneo Ueno, Shimonoseki, and Masayuki Nishimoto, Ube, all of Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Nov. 17, 1981, Ser. No. 322,364
Claims priority, application Japan, Nov. 20, 1980, 55-163829; Nov. 20, 1980, 55-163830; Dec. 23, 1980, 55-181334; Jun. 12, 1981, 56-90296
Int. Cl.³ B22D *17/20*
U.S. Cl. 164—305 **24 Claims**

1. A gas-venting arrangement incorporated with a mold including stationary and movable mold halves, together defin-

ing a cavity to be filled with a melt, said gas-venting arrangement comprising:

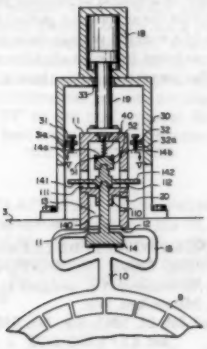
a gas vent passage formed in said mold to communicate with said cavity;

at least one by-pass passage branched from said gas vent passage;

a gas discharge passage formed in said mold to communicate with the outside of said mold;

a valve chamber mounted for movement relative to said mold and including a valve seat communicable with said gas vent passage, by-pass passage and gas discharge passage;

valve means, including a movable valve for engagement and disengagement with said valve seat to open and close said gas vent passage, said by-pass passage and said gas discharge passage in such a manner that said valve prevents said gas vent passage from communicating with said gas discharge passage but allows said by-pass passage to communicate with said gas discharge passage, when said valve is in a first position relative to said valve chamber, and prevents said by-pass passage and said gas vent passage from communicating with said gas discharge passage, when said valve is in a second position relative to said valve chamber;



said valve including a valve extension being slidable within said valve chamber;

first means connected to said valve extension for urging said valve toward said second position, maintaining said valve in said second position, and preventing oscillation of said valve when said valve is moved from said first position to said second position;

second means for engaging a portion of said valve extension and opposing said first means sufficiently to restrain said valve from moving to said second position until an additional force acts against said valve and moves it to said second position; and

third means connected to said movable valve chamber for moving said valve against the force of said first urging means from said second position to said first position;

whereby said valve during an initial molding operation is placed in the first position by said third means and restrained in that position by said second means, said valve is forced to move from said first position to said second position when a part of the melt flowing out of said cavity flows through said gas vent passage and impinges against said valve with sufficient force to overcome said second means, and said valve is maintained in said second position by said first means until the third means is activated to return said valve to said first position.

4,489,772

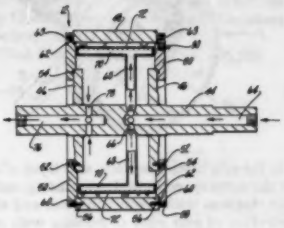
DRUM FOR CONTINUOUS CASTING MACHINE

Jack E. McLane, Port Huron; Raymond L. Schenk, Marysville, and John W. Wirtz, Port Huron, all of Mich., assignors to Wirtz Manufacturing Company, Inc., Port Huron, Mich.

Filed Sep. 27, 1982, Ser. No. 423,997

Int. Cl.³ B22D *11/00, 11/124*

U.S. Cl. 164—423 **4 Claims**



1. In a machine for continuously casting battery grids, the machine being of the type which includes a rotating drum having a cavity on the outer peripheral surface thereof which defines the battery grid pattern and a shoe through which molten lead is directed, said shoe having an arcuate surface in mating engagement with an arcuate portion of the outer peripheral surface of the drum and also having in said surface an orifice slot for directing the molten lead into said recessed grid pattern, said drum having an inlet and an outlet for circulating coolant therethrough, the improvement wherein said drum comprises a central rotatable support shaft, a pair of discs mounted on said shaft in fixed axially spaced relation, said discs having axially outer faces lying in accurately parallel planes perpendicular to the rotating axis of the shaft, a pair of annular side plates releasably mounted against said outer faces of the two discs and in sealed relation therewith, said side plates extending radially outwardly beyond the outer peripheries of said discs, the axially inner opposed faces of said side plate having flat, radially outer annular surface portions lying in accurately parallel planes perpendicular to said rotary axis, a shell having axially extending inner and outer peripheral surfaces and axially opposite end surfaces extending radially between and intersecting said inner and outer peripheral surfaces, the radial dimension of said end faces being approximately the same as the maximum radial thickness of the shell between its opposite ends, said end faces being flat and lying in accurately parallel planes perpendicular to said rotary axis, said radially outer annular surface portions of said side plates being in abutting and sealed overlapping relation with said flat end faces of the shell, the flat overlapping surface portions of the side plates and the end faces of the shell having a plurality of registering, axially extending openings therein and a plurality of pins frictionally engaged in said registering openings, said pins being radially compressible throughout their length to accommodate radial thermal expansion and contraction of the shell relative to the side plates.

4,489,773

METHOD OF CASTING WITH POOL BOILING COOLING OF SUBSTRATE CASTING SURFACE

Russell S. Miller, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

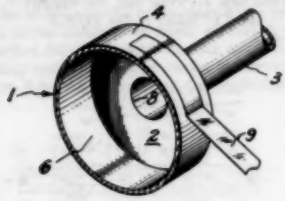
Filed Dec. 21, 1981, Ser. No. 332,787

Int. Cl.³ B22D *11/06, 11/124*

U.S. Cl. 164—463 **13 Claims**

1. A method for casting metal or metal alloy on a rapidly moving surface comprising: depositing a layer of molten metal or metal alloy on a casting surface of a rapidly moving thermally conductive substrate and thereafter removing the resulting casting of said metal or metal alloy therefrom, wherein said

casting surface is cooled to a temperature below the solidification point of said metal or metal alloy by contacting a layer of coolant to an accelerating non-casting surface of said substrate wherein acceleration of said non-casting surface is substantially



normal to the non-casting surface, said layer of coolant moving at about the same speed as said non-casting surface so as to be relatively stagnant with respect thereto, and effecting boiling at the interface of said layer of coolant with said non-casting surface.

4,489,774

ROTARY CORDIERITE HEAT REGENERATOR HIGHLY GAS-TIGHT AND METHOD OF PRODUCING THE SAME

Yutaka Ogawa; Shunichi Yamada, both of Nagoya, and Toshiyuki Hamanaka, Suzuka, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Oct. 11, 1983, Ser. No. 540,306

Int. Cl.³ F28D *15/00*

U.S. Cl. 165—10 **5 Claims**

1. A rotary cordierite heat regenerator with a high gastightness, comprising a honeycomb structural body with a porosity of 20-45%, said honeycomb structural body mainly consisting of cordierite, open pores of partition walls of said honeycomb structural body defining channels thereof being sealed with filler substances applied thereto, the difference of thermal expansion between the honeycomb structural body and the filler substances being less than 0.1% at 800° C.

4,489,775

DESUBLIMATOR FOR ISOLATING SUBLIMATION PRODUCTS FROM REACTION GASES

Harry Kassat, Bochum; Friedrich Wirth, and Joachim Wagner, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

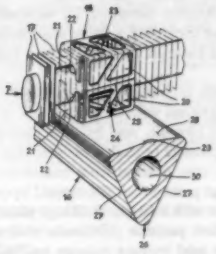
Filed Jul. 28, 1981, Ser. No. 287,783

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1980, 3029744

Int. Cl.³ B01D *7/00, 51/00*; F28F *9/00, 7/00*

U.S. Cl. 165—67 **7 Claims**

1. A desublimator for isolating sublimation products from reaction gases, including a closed housing for the reception or passage of the reaction gas and a plurality of rows of finned tubes accommodated horizontally and superposedly therein, for alternate internal exposure to a heating medium or cooling medium, in which desublimator the reaction gas is passed downward crosswise to the finned tubes and flow of heating medium or cooling medium therein, the successive superposed finned tubes of each row being alternately connected together at one end, by a hairpin-shaped bend, and being provided, at the opposite end, with connections for introducing and discharging the heating medium or cooling medium, the improvement comprising: cage-like perforated sliding shoes on the superposed tubes being supported, and mutually spaced, with limited adjustability, by means of said cage-like perforated



sliding shoes surrounding said tubes in a box-like manner, the sliding shoes of the individual finned tubes of all rows of tubes or groups of tubes being directly stacked one above the other and resting loosely on common supporting girders anchored to the housing, wherein the supporting girders have, in cross-section, the outline of a triangle with its apex being rounded and pointing downward and having a slightly convex upper surface forming a flat lengthwise ridge thereon.

4,489,776

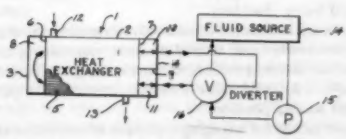
HEAT EXCHANGER WITH TUBE CLEANING ELEMENT CAPTURING CAGE INTERCONNECTION

Walter J. Baron, Milwaukee, Wis., assignor to Water Services of America, Inc., Milwaukee, Wis.

Filed Jul. 21, 1983, Ser. No. 516,696

Int. Cl.³ F28G *1/12*

U.S. Cl. 165—95 **8 Claims**



1. In a heat exchanger, the combination comprising:

(a) a housing,

(b) a plurality of fluid flow tubes disposed in general parallelism within said housing and with said tubes being arranged with exposed open ends adapted to communicate with a housing chamber,

(c) a plurality of separate longitudinally extending baskets disposed in said chamber for capturing and holding shuttle type tube cleaning elements therein,

(d) the inner end portions of some of said baskets being rigidly attached to the said ends of some of said tubes, and the inner end portions of others of said baskets being freely mounted to the said ends of others of said tubes,

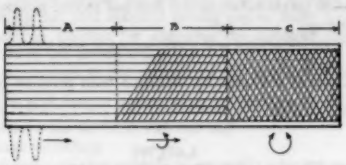
(e) and connector means connected to said rigidly attached baskets to hold said freely mounted baskets against outward axial movement.

4,489,777

HEAT PIPE HAVING MULTIPLE INTEGRAL WICK STRUCTURES

Anthony C. Dei Bagno; Richard R. Giordano, and Frederick Rose, all of 12 Cedar St., Newton, N.J. 07860

Filed Jan. 21, 1982, Ser. No. 341,360
Int. Cl.³ F28D 15/00
U.S. Cl. 165—104.26 4 Claims



1. An improved internal heat pipe construction for a heat pipe containing a heat transfer liquid and having a condensor section, an adiabatic section and an evaporator section, wherein the improvement comprises:

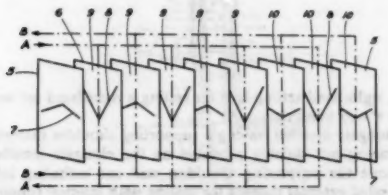
diverse capillary wicking patterns formed integrally with the interior walls by cutting the wall surface of the condensor, adiabatic and evaporator sections respectively, wherein one of said diverse wicking patterns comprises a plurality of parallel axial grooves, and another of said diverse wicking patterns comprises a plurality of angled parallel circumferential grooves; wherein the capillary grooves serve as the sole means for moving the liquid phase of said heat transfer liquid through said heat pipe, and the circumferential grooves are disposed at an angle other than 90° to the axial grooves for the purpose of feeding the heat transfer liquid between said sections.

4,489,778

PLATE HEAT EXCHANGER

Malte Skoog, Stjärngatan 20, Lund S-223 57, Sweden

Filed Mar. 2, 1983, Ser. No. 471,288
Claims priority, application Sweden, Mar. 4, 1982, 8201328
Int. Cl.³ F28F 3/04, 13/06
U.S. Cl. 165—166 4 Claims



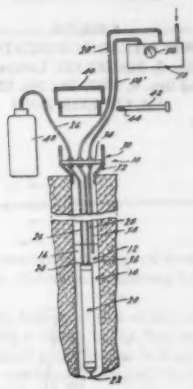
1. Heat exchanger comprising a plurality of plates (5, 6), provided with corrugations (7, 8) and arranged adjacent to each other in order to define sealed passages (9, 10) therebetween for enclosing two separate mutually heat exchanging fluids, said plates being of a first type in which the corrugations form a first angle (α_1) with the longitudinal rim of the plate, and of a second type in which the corrugations form a second angle (α_2) with the longitudinal rim of the plate, and at least a portion of said plurality of plates being alternately arranged, i.e. a plate of the first type is followed by a plate of a second type and so on, wherein in said portion of alternately arranged plates a plurality of a first couple of plates are arranged with the corrugations thereof directed in the same direction, whereby the corrugations intersect at a first angle (β_1) in order to define first passages having a first thermal length, and a plurality of a second couple of plates are arranged with the corrugations thereof directed in the opposite directions, whereby the corrugations intersect at a second angle (β_2) in order to define second passages having a second thermal length.

4,489,779

FLUID SAMPLING APPARATUS

William D. Dickinson, Ypsilanti; David Mioduszewski, and Frederick E. Bernardin, Jr., both of Ann Arbor, all of Mich., assignors to Quantitative Environmental Decisions Corporation, Ann Arbor, Mich.

Filed Feb. 28, 1983, Ser. No. 470,305
Int. Cl.³ E21B 49/08
U.S. Cl. 166—64 26 Claims



1. A groundwater sampling apparatus for withdrawing groundwater samples from a groundwater monitoring well, said apparatus having dedicatable inground components to prevent the apparatus from contaminating another well, said apparatus comprising:

a gas-actuated pump adapted to be submerged in the groundwater within said well for pumping a portion of said groundwater therefrom, said pump being permanently dedicatable to said well and having a pump body portion including a gas chamber, a groundwater chamber having an inlet and an outlet, and a flexible bladder for isolating said gas chamber from said groundwater chamber, said groundwater chamber being in communication with said groundwater in said well through said inlet when said pump is submerged therein;

a wellhead assembly permanently dedicatable to said well and including a wellhead body portion adapted to be secured to said well to isolate the interior of said well from the above-ground surroundings, said wellhead assembly further including a gas conduit having one end sealingly connected to said gas chamber and an opposite end fixedly and sealingly connected to said wellhead body portion, a substantially continuous groundwater conduit having one end sealingly connected to said outlet of said groundwater chamber, said groundwater conduit substantially uninterruptedly passing through said wellhead assembly to an opposite end in communication with the above-ground surroundings for collecting a sample quantity of said groundwater from said well prior to substantial contact with the above-ground air; and

controller apparatus including means selectively connectable to, and disconnectable from, said wellhead assembly in fluid communication with said gas conduit for supplying an actuating gas to said gas chamber of said pump and for alternately pressurizing and relieving the pressure of said actuating gas in said gas chamber in order to cause

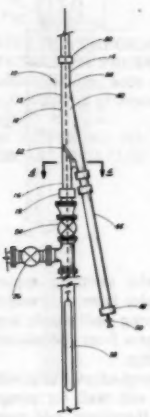
said bladder to alternately contract and relax and actuate said pump, said pump relying substantially upon the natural hydraulic head of said well to urge groundwater into said groundwater chamber upon relaxation of said bladder, said controller apparatus including a source of pressurized actuating gas, control valve means for connecting said pressurized gas source to said gas conduit and disconnecting said pressurized gas source therefrom in response to predetermined actuating gas pressure levels in said gas chamber, said controller apparatus being portable and transportable so as to be selectively connectable to, and disconnectable from, the gas conduit of said monitoring well or to the gas conduit of correlative dedicated in-ground components in similar monitoring wells.

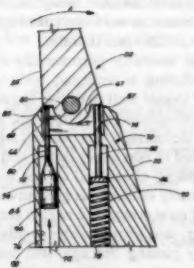
4,489,780

WELLHEAD LUBRICATOR

Gus A. Duhon, Rte. 3, Box 252 GD, Lafayette, La. 70503

Filed Sep. 6, 1983, Ser. No. 529,561
Int. Cl.[3] E21B *23/00*
U.S. Cl. 166—70 16 Claims





1. A wellhead lubricator comprising:

a. a housing arranged for vertically extending attachment to a wellhead assembly and having a wireline for supporting a wireline tool therein and passing said wireline tool in and out of said well through the point of attachment to said wellhead;

b. a first portion extending laterally from said housing and normally forming a part of the chamber in said housing;

c. a second portion extending longitudinally from said laterally extending portion and connected thereto and having an opening for passage of a wireline tool therethrough while said housing remains attached to said wellhead;

d. means for closing said tool opening;

e. means supported in said housing and movable between a first position for guiding said wireline tool in and out of said well through the point of attachment to said wellhead and a second position for guiding said wireline tool to said longitudinally extending portion; and

f. means for selectively controlling the movement of said guide means between said first and second positions, comprising:

i. a spring urging said guide means to said second position; and

ii. means activated by wellhead fluid pressure for selectively urging said guide means to said first position.

4,489,781

SETTING TOOL AND RIGHT-HAND SET MECHANICAL LINER HANGER

Benjamin R. Weeks, 3720 Country Estates, Corpus Christi, Tex. 78410

Continuation-in-part of Ser. No. 465,738, Feb. 11, 1983,. This application Jun. 27, 1983, Ser. No. 507,889
Int. Cl.[3] E21B *23/00*
U.S. Cl. 166—208 5 Claims

1. A right-hand setting tool for setting a right-hand set well tool in a well comprising,

an elongate member having a supporting shoulder thereon,

a running nut slidably mounted on the elongate member above the supporting shoulder, said nut including left-handed external threads for mating with internal running threads on a well tool for supporting said well tool from the supporting shoulder, said nut including an out of round internal contour for being driven in a rotative direction by the elongate member,

a setting nut slidably mounted on the elongate member above the running nut, said setting nut including coacting engaging means for engaging a well tool for setting the well tool, said setting nut including an out of round internal contour for being driven in a rotative direction by the elongate member,

a spacing shoulder on said elongate member above the setting nut,

said elongate member having an out of round external contour adjacent to and above the supporting shoulder for rotating said setting nut for setting the well tool and said elongate member having a round contour above the out of round contour whereby after setting the well tool the elongate member can be lowered to bring the round con-

tour into registry with the setting nut when the spacing shoulder engages the setting nut whereby further right-hand rotation will disengage the running nut from the well tool,

a right-hand mechanical liner hanger for engaging the inside of a well conduit and adapted to be set by the setting tool comprising,

a mandrel having an annular wedge cone around the outer circumference of the mandrel, said mandrel having internal running threads for coacting with the threads on the running nut, said mandrel having one or more upwardly extending notches for engaging the coacting engaging means of the setting nut,

a lug connected to the outside of the mandrel below the cone,

a cage telescopically and rotationally movable on the mandrel between the cone and said lug,

said cage including,

a plurality of slips extending upwardly adapted to move upwardly onto the cone and outwardly to a set position for engaging a well conduit,

a plurality of bow springs extending outwardly for engaging a well conduit for allowing longitudinal and rotational movement of the cage relative to the mandrel,

said cage including an upwardly directed opening for engagement by the lug whereby the cage can be moved downwardly in a well conduit with the mandrel while preventing the slips from setting,

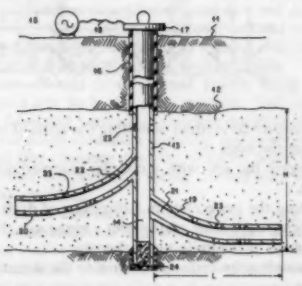
said cage including a clockwise downwardly extending and downwardly directed spiral surface extending from above the opening to past the bottom of the opening whereby an upward movement of the mandrel will move the lug out of the opening onto the downwardly directed surface and right-hand rotation of the mandrel will move the slips upwardly onto the cone for setting.

4,489,782

VISCOUS OIL PRODUCTION USING ELECTRICAL CURRENT HEATING AND LATERAL DRAIN HOLES

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 12, 1983, Ser. No. 560,697
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—248 **26 Claims**



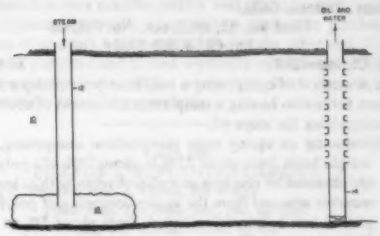
1. A method of producing oil from a subsurface formation containing viscous oil comprising drilling and completing a first well in said formation in a manner such that said well has an essentially vertical portion and at least one drain hole extending laterally from the longitudinal axis of said portion of said first well, at least a part of said laterally extending drain hole traversing a part of said formation, said vertical portion of said first well being in communication with the surface of the earth, said drain hole being in fluid communication with said vertical portion of said first well, said first well being completed in said formation in a manner such that the effective radius of said well is substantially greater than the effective radius of a vertical well completed in said formation, applying electric current through said first well into said formation, and producing oil through said drain hole and said first well.

4,489,783

VISCOUS OIL RECOVERY METHOD

Winston R. Shu, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 7, 1982, Ser. No. 447,730
Int. Cl.³ E21B *43/25*
U.S. Cl. 166—272 **10 Claims**



1. A method of recovering viscous oil from a subterranean, low transmissibility, viscous oil-containing formation comprising:

(a) penetrating the formation with at least one injection well and establishing a cavity in the bottom portion of said formation adjacent said injection well and extending horizontally from one-third to one-half the distance between the injection well and the production well and vertically up to one-fifth the thickness of the formation and having a void space not greater than 0.10 pore volume, said injection well being in fluid communication with said cavity;

(b) penetrating the formation with at least one production well spaced apart from said injection well, said production well being in fluid communication with the upper two-thirds or less of the vertical thickness of the formation;

(c) injecting 0.35 to 0.45 pore volume of steam at an injection rate within the range of 4.5 to 6.5 barrels/day/ac.-ft. into the cavity in the lower portion of the formation via said injection well and recovering fluids including oil from the formation via said production well;

(d) subsequently shutting in said injection well and continuing to recover fluids including oil from the formation via said production well for a predetermined period of time and recovering fluids including oil from the formation via the production well without steam breakthrough;

(e) injecting a predetermined amount of hot water or low quality steam into the formation via said injection well; and

(f) continuing to recover fluids including oil from the formation via said production well until the recovered fluids contain an unfavorable amount of steam or water.

4,489,784

WELL CONTROL METHOD USING LOW-MELTING ALLOY METALS

Joseph U. Messenger, 2906 Gladiolus La., Dallas, Tex. 75233

Filed Feb. 2, 1983, Ser. No. 463,224
Int. Cl.³ E21B *33/13*
U.S. Cl. 166—288 **12 Claims**

1. A method for controlling or terminating the flow of gas, oil or other fluids from an uncontrolled well penetrating a subterranean formation which comprises introducing into the active string low-melting metallic balls, and melting at least some of said metal balls at a temperature below that of the

formation at the bottom end of the active casing or tubing string.

6. A method for controlling or terminating the flow of gas, oil or other fluids from an uncontrolled well penetrating a subterranean formation which comprises introducing into the active string liquid alloy which will cool and solidify in the well to thereby form a plug of solid alloy in the string to stop said flow.

4,489,785

METHOD OF COMPLETING A WELL BORE PENETRATING A SUBTERRANEAN FORMATION

Robert C. Cole, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 19, 1983, Ser. No. 515,326
Int. Cl.³ E21B *33/14*
U.S. Cl. 166—295 **15 Claims**

1. A method of completing a well bore penetrating a subterranean formation having a temperature in excess of about 120° F. comprising the steps of:

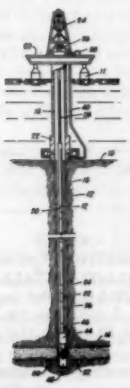
introducing an epoxy resin composition comprising, on a weight basis, from about 25% to about 35% of a polyepoxide obtained by reacting an epihalohydrin with at least one member selected from the group consisting of polyhydric phenol and polyhydric alcohol, from about 5% to about 25% of a liquid diluent comprising an aromatic hydrocarbon of the general formula $C_6(R_1)_6$ wherein R_1 is hydrogen, a straight or branched chain alkyl radical, a cycloparaffin radical or a mixture thereof wherein each alkyl and cycloparaffin radical has about 1 to 10 carbon atoms, from about 0.25% to about 2.5% of a curing agent comprising 2-ethyl-4-methylimidazole and a solid diluent into a subterranean formation to be sealed; and, maintaining the epoxy resin composition in said formation until the resin composition cures to a high-strength, substantially crack-free, impermeable solid.

4,489,786

LOW PRESSURE RESPONSIVE DOWNHOLE TOOL WITH DIFFERENTIAL PRESSURE HOLDING MEANS

Harold K. Beck, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 19, 1983, Ser. No. 533,701
Int. Cl.³ E21B *34/10*
U.S. Cl. 166—374 **15 Claims**



11. A method of operating an annulus pressure responsive downhole tool of the type including a power piston slidably disposed in a housing and first and second pressure conducting passages communicating a well annulus with first and second sides of said power piston, said method comprising the steps of:

applying an increase in annulus fluid pressure to an annulus fluid in said well annulus;

communicating said increase in annulus fluid pressure to said first side of said power piston through said first pressure conducting passage;

delaying communication of a sufficient portion of said increase in annulus fluid pressure to said second side of said power piston a sufficient time to allow a pressure differential from said first side to said second side of said power piston to move said power piston from a first position thereof to a second position thereof relative to said housing;

relieving from said second pressure conducting passage a volume of fluid sufficient to permit said power piston to travel to its said second position; and

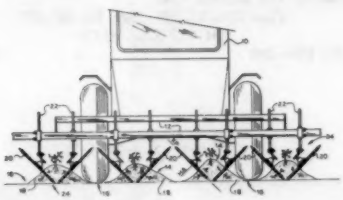
releasably preventing said power piston from returning to its first position by preventing communication of a sufficient portion of said increase in annulus fluid pressure to said second side of said power piston so that so long as said increase in annulus fluid pressure is maintained on said first side of said power piston a sufficient pressure differential is maintained from said first side to said second side of said power piston to prevent said power piston from returning to its said first position.

4,489,787

ANGLED ROLLING KNIVES AND METHOD OF WEEDING

David A. Gary, O'Donnell, Tex., assignor to William A. Russ, Tahoka, Tex., a part interest

Filed Nov. 15, 1982, Ser. No. 441,679
Int. Cl.³ A01B *39/08, 39/14*
U.S. Cl. 172—1 **6 Claims**



5. The improved method of cutting the roots of weeds in soil comprising the steps of:

a. engaging the soil with a circular sharp-edged, flat knife plate,

b. drafting the knife plate in a direction of draft while

c. swinging each knife plate about a hinge axis that is within the plane of the knife plate, thereby

d. maintaining the knife axis normal to the direction of draft, while

e. rolling the knife plate within the soil about a knife axis that is normal to the knife plate and not greater than 50° from vertical, thereby

f. severing the roots of weeds within the soil with minimal soil disturbance,

g. said knife engaging one side of a raised bed in the soil,

h. adjusting the angle of the knife axis by

i. changing the angle of the hinge axis from vertical, and

j. adjusting the spacing of the hinge axis from the bed, thereby

k. selecting the path of the knife plate within the bed.

4,489,788

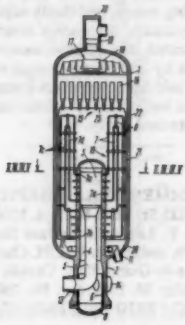
STEAM GENERATOR

Alexandr S. Shamarokov, Profsojuznaya utitsa, 114; korpus 4, kv. 491; Alexei V. Kuzmin, prospekt Vernadskogo, 89, korpus 2, kv. 72; Vladimir P. Glebov, ulitsa admirala Makarova, 43, korpus 1, kv.76; Viktor F. Moskvichev, Solovilny proezd, 18, kv. 229; Nadezhda A. Morozova, Korovinskoe shosse, 8, korpus 1, kv.50; Gennady A. Filippov, Molodogvardeiskaya ulitsa, 24, korpus 1, kv.34, all of Moscow; Gennady A. Tarankov, Podolsk, Gulevsky proezd, 8/5, kv.32; Boris I. Lukasevich, Podolsk, ulitsa Entuziastov, 1, kv.20, both of Moskovskaya oblast; Leonid M. Andreev, ulitsa Vorontsovskaya 30b, kv.101, Moscow, and Viktor I. Grishakov, ulitsa Sverdlova, 54, kv.169, Podolsk Moskovskoi oblasti, all of U.S.S.R.

Filed Jan. 31, 1983, Ser. No. 462,445

Int. Cl.³ F22B *1/04*

U.S. Cl. 122—32 3 Claims



1. A steam generator comprising:

a casing;

an inner wall of said casing;

a vertically extending manifold located in said casing;

a first chamber in said vertically extending manifold for admitting a coolant;

a second chamber in said vertically extending manifold for removing coolant, said second chamber being isolated from said first chamber;

tubes for conveying the coolant including riser portions and downtake portions assembled into bundles and defining a heat transfer surface, said riser portions and said downtake portions extending in said casing in parallel with the vertical axis of said vertically extending manifold;

inlet portions of said tubes of each bundle being in fluid communication with the riser portions and extending radially from said vertically extending manifold and fixed to said vertically extending manifold and communicating with said first chamber, the inlet portions being bent and having their concave side facing toward said vertically extending manifold,

outlet portions of said tubes of each bundle having one end in fluid communication with said downtake portions and the other end extending radially from said vertically extending manifold and fixed to said vertically extending manifold and communicating with said second chamber, said outlet portions being bent and having their concave side facing toward said vertically extending manifold;

a first annular manifold for uniformly distributing feed water over a cross-section of an intertube space, said annular manifold extending horizontally and concentrically with said vertically extending manifold;

a pipe for admitting feed water to the intertube space being secured to said casing and communicating with said first annular manifold;

a pipe for removing steam to a user secured to said casing;

a steam separator accommodated in said casing upstream from said heat transfer surface in the steam flow direction, said steam separator being secured to an annular plate, said annular plate being secured to the inner wall of said casing; and

means for returning recirculation water back to the intertube space, said means connecting said steam separator with the intertube space;

wherein the longitudinal axis of each riser portion is spaced from said vertically extending manifold and extends in the same radial direction from said vertically extending manifold as its respective inlet portion, and the longitudinal axis of each downtake portion is spaced from the vertically extending manifold and extends in a different radial direction from said vertically extending manifold than its respective riser portion, and the end of each outlet portion communicating with its respective downtake portion is bent at an acute angle with respect to the other end of the outlet portion fixed to said vertically extending manifold, wherein the vertex of the acute angle faces toward said vertically extending manifold.

4,489,789

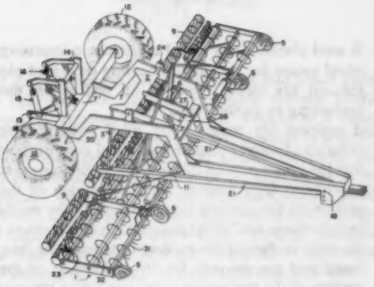
TILLAGE AND PLANTER CARRIER

Ronald E. Pearce, Rte. 3, Cisne, Ill. 62823

Filed Aug. 13, 1982, Ser. No. 383,967

Int. Cl.³ A01B *49/06, 73/00*

U.S. Cl. 172—443 1 Claim



1. An agricultural apparatus adapted to support multiple longitudinally spaced implements for selective vertical movement from lowered positions of use to raised positions for transport, said apparatus comprising: A pair of rearwardly diverging longitudinally extending main frame members connected at their forward ends and provided with towing hitch means, the rearwards ends of said main frame members being connected to a transverse beam having laterally spaced support wheels rotatably secured thereto, the central portion of said main frame members being arched upwardly from the forward and rearward ends thereof and provided at the upper portion of the arch with means for suspending a tillage implement positioned transversely of said apparatus and extending laterally on each side of said main frame members, said tillage implement including a pair of secondary frame members pivotally connected at their forward ends to said main frame members adjacent said hitch means and diverging rearwardly beneath said main frame members, said tillage implement comprising a plurality of generally parallel tool bar frame members having earthworking tools secured thereto, said tool bar frame being rigidly connected to said secondary frame for vertical movement therewith, said tillage frame suspending means including vertically extending connecting elements secured to said secondary frame to permit floating operation during use and including remotely operable power means to raise said tillage implement for transport, and three point hitch means secured to said transverse beam adapted to have a planter

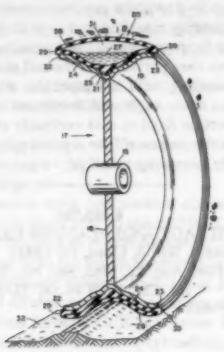
secured thereto and being independently remotely operable to raise and lower the planter.

4,489,790

SEED PLANTER PRESS WHEEL

Leonard Lattin, P.O. Box 447, Natalia, Tex. 78059

Filed Dec. 15, 1982, Ser. No. 450,077
Int. Cl.³ A01B 29/00
U.S. Cl. 172—519 6 Claims



1. A seed planter press wheel apparatus, comprising:

a wheel means for rotatably mounting on a seed planter;

a resilient tire means mounted on said wheel means for contacting an earthen seed bed;

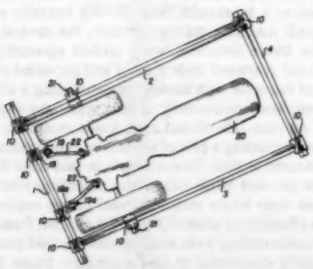
said resilient tire means being filled with predetermined volumes of incompressible liquid and compressible gas so that the upper portion of the resilient tire means stretches a predetermined amount upon contacting of the lower portion of the resilient tire means with the earthen seed bed to release and inhibit the sticking of any caked mud on the outer surface of the resilient tire means the ratio of said liquid and gas provide for the collapsing of the lower portion of the tire means upon contacting the seed bed.

4,489,791

WRAP AROUND TOOL BAR STRUCTURE

Arthur C. Schneider, 936 E. Maple Ave., Mora, Minn. 55051

Filed Jul. 2, 1982, Ser. No. 394,829
Int. Cl.³ A01B 63/102
U.S. Cl. 172—776 4 Claims



1. In combination with a tractor including a tractor body equipped with a hydraulic lift system, a rear axleshaft extending from either side of the rearward portion of said tractor body, said rear axleshaft being provided with rear wheels on the outer ends of said axleshaft, said rear axleshaft having rear axleshaft extensions projecting outwardly from the rear wheels thereon, a tool bar structure comprising:

a. a pair of transversely positioned frame members connected to a pair of longitudinally positioned frame members to form a rigid rectangularly configured frame structure;

b. pivotal mounting means attached to said longitudinally positioned frame members and pivotally mounted on said axleshaft extensions to allow the entire rectangularly configured frame structure to pivot and be carried on said rear axleshaft extensions outside the rear wheels;

c. depth adjusting means positioned between said body of said tractor and said rigid rectangularly configured frame structure to provide the proper attitude thereof, said rectangularly configured frame structure being carried and solely supported by said axle extensions and said depth adjusting means, said depth adjusting means being connected to said frame structure only rearwardly of said pivotal mounting means, said depth adjusting means comprising said hydraulic lift system attached to the more rearwardly located one of said transversely positioned frame members by attachment means; and

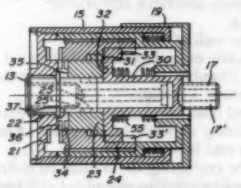
d. at least one of said frame members being configured so as to provide tool bar means to which implements may be attached or detached easily.

4,489,792

HAMMER DRILL ADAPTER

Atef E. F. Fahim, 2125 St. Marc St., Apt. 1108, Montreal, P.Q., Canada; Rock S. Y. Lee, 5910 Terrace Beausejour, St. Hubert, P.Q., Canada, and Richard M. H. Cheng, 3452 Rosedale Ave., Notre-Dame-de-Grace, P.Q., Canada

Filed May 28, 1981, Ser. No. 268,053
Int. Cl.³ E02D 7/02; F16H 37/16
U.S. Cl. 173—48 16 Claims



1. An adapter device for securement to an output rotary drive of a drill, said adapter comprising

a housing having an input shaft supported for axial rotation in said housing and having a connectable end for securement to said rotary drive,

an output connector, said input shaft and said output connector being disposed on a common axis,

a fixed mode cam immovably secured with respect to said housing and comprising a sloped cam surface and a first toothed circumferential ring,

an annular floating cam in sliding non-rotational engagement with and about said input shaft, said floating cam comprising a toothed ring engageable with said first toothed ring of said fixed mode cam,

an annular keying element disposed about said floating cam and in engagement with said output connector, said keying element being displaceable in and out of engagement with said floating cam and also displaceable so as to be substantially radially adjacent to said first toothed ring of said fixed mode cam, and

selective adjustment means for cooperating with said sloped cam surface to displace said keying element in and out of engagement with said fixed mode cam and said floating cam, wherein said input shaft can impart a rotary drive, rotary drive and impact forces or impact forces only to

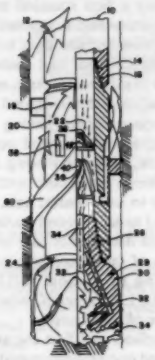
said output connector and wherein said first toothed ring of said fixed mode cam and said toothed ring of said floating cam together comprise means for creating said impact forces during said engagement thereof.

4,489,793

CONTROL METHOD AND APPARATUS FOR FLUID DELIVERY IN A ROTARY DRILL STRING

Roy Boren, 900 N. 40th St., Birmingham, Ala. 35222

Filed May 10, 1982, Ser. No. 376,340
Int. Cl.³ E21B *21/00*
U.S. Cl. 175—71 **14 Claims**



1. In an apparatus for controlling and directing fluid such as air which is delivered through a drill string conduit such as pipe in a hole to a drill string rotary bit through passageways in said pipe and said bit:

a control housing mounted in said drill string above said drill bit and comprising a passageway in communication with said pipe and said bit,

divider means within said housing comprising a plurality of stationary first divider leg members for separating and dividing the fluid traveling downwardly through said passageway toward the bit,

and a stationary divider dome supported above said leg members within said housing and within the passageway having fluid traveling downwardly therein, said dome having openings therein and means thereon for directing the fluid through said openings to and against said legs.

4,489,794

LINK TILTING MECHANISM FOR WELL RIGS

George I. Boyadjieff, Anaheim, Calif., assignor to Varco International, Inc., Orange, Calif.

Filed May 2, 1983, Ser. No. 490,679
Int. Cl.³ E21B *19/06*
U.S. Cl. 175—85 **14 Claims**

1. Well drilling apparatus comprising:

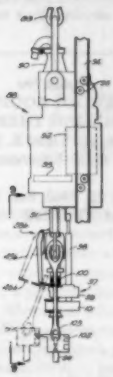
a drilling unit including a rotary element adapted to be connected to the upper end of a drill string for rotation therewith about the axis of the string, and a motor operable to drive said element and the connected string rotatively about said axis;

an elongated guide structure which extends generally vertically parallel to said axis and which guides the drilling unit for movement upwardly and downwardly with a connected drill string to drill a well;

a torque wrench carried at the lower end of said drilling unit in axial alignment with said rotary element for movement upwardly and downwardly with the drilling unit along said axis and having two sections which apply torque in opposite directions to said rotary element and a section of said drill string to make or break a connection therebetween;

two links having upper ends connected to said drilling unit for movement upwardly and downwardly therewith and in a relation suspending the links at opposite sides of said axis;

an elevator connected to lower ends of said links and suspended thereby beneath said torque wrench and adpated to support a section of said drill string in axial alignment with said torque wrench; and



power actuated means operable to swing said lower ends of the links and the elevator suspended thereby laterally outwardly relative to said torque wrench in a relation shifting said elevator between a first position in which it is beneath the torque wrench and aligned therewith along said axis to suspend a section of the drill string in axial alignment with the torque wrench and a second position in which the elevator is offset to a side of said axis and is not aligned with the torque wrench, to engage a section of drill pipe offset from said axis, while the torque wrench and drilling unit remain in alignment with said axis.

4,489,795

SHOCK RESISTANT DIGGING IRON

Richard F. Leidy, 4910 Arters Mill Rd., Westminster, Md. 21157

Filed May 17, 1982, Ser. No. 379,093
Int. Cl.³ B25G *1/12*
U.S. Cl. 175—320 **1 Claim**

1. In a digging iron having a digging end of metal in the shape of a wedge, a shaft with an upper end and a lower end, and means connecting the digging end and the shaft; the im-

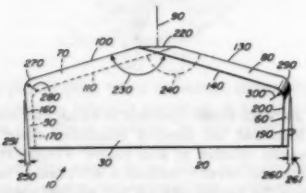
provement comprising: the shaft being of unwettable dielectric material, a top section of metal on said shaft; said unwettable dielectric material composed of a solid rod of solid fibreglass, said shaft having a smooth glazed finish, and means connecting comprising the shaft axially supported in first socket structure in said digging end; the shaft axially supported in second socket structure in said top section, the shaft having a respective shoulder engaging each of said first and second socket structures, a respective socket bottom supporting each end of upper and lower ends of said shaft, said top section having a portion with a substantially flat upper surface for driving, said top section substantially balancing said digging end, and said solid rod of solid fibreglass covered by a water-shedding dielectric layer.

4,489,796

INSERT FOR A MINE TOOL ROOF BIT AND A METHOD OF DRILLING THEREWITH

Jaime Sanchez, Newton, and Vinod K. Sarin, Lexington, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 25, 1983, Ser. No. 497,960
Int. Cl.³ E21B *17/00*
U.S. Cl. 175—410 **8 Claims**



1. A mine tool roof bit insert of a hard wear-resistant cemented carbide comprising

a flat elongated member having

a bottom surface, a first side surface, a second side surface, a first end surface, a second end surface, a first top surface, a second top surface, and a central axis; said first side surface being substantially parallel with said second side surface, said first side surface and second side surface being substantially perpendicular to said bottom surface;

an intersection of said first side surface and said first top surface forming a first top cutting edge, an intersection of said second side surface and said first top surface forming a first top trailing edge, said first top cutting edge having a first top relief angle between said first top cutting edge and said first top trailing edge;

an intersection of said second side surface and said second top surface forming a second top cutting edge, an intersection of said first side surface and said second top surface forming a second top trailing edge, said second top cutting edge having a second top relief angle between said second top cutting edge and said second top trailing edge;

an intersection of said first side surface and said first end surface forming a first end cutting edge, an intersection of said second side surface and said first end surface forming a first end trailing edge, said first end cutting edge having a first clearance angle between said first end cutting edge and said first end trailing edge;

an intersection of said second side surface and said second end surface forming a second end cutting edge, an intersection of said first side surface and said second end surface forming a second end trailing edge; said second end cutting edge having a second clearance angle between said second end cutting edge and said second end trailing edge;

an intersection of said first top surface and said second top surface forming a top edge; an intersection of said first top cutting edge and said second top trailing edge forming a first top included angle;

an intersection of said second top cutting edge and said first top trailing edge forming a second top included angle;

said first end surface and said second end surface angling downward toward said bottom surface forming a taper, said taper having a first included taper angle between said first end surface and said central axis and a second included taper angle between said second end surface and said central axis;

an intersection of said first top surface and said first end surface forming a first rounded corner having a first radius of curvature said first rounded corner having a point located thereon, said pont being located at a first maximum distance from said central axis along a line perpendicular to said central axis, an intersection of said second top surface and said second end surface forming a second rounded corner having a second radius of curvature said second rounded corner having a point located thereon, said point being located at a second maximum distance from said central axis along a line perpendicular to said central axis, said first maximum distance added to said second maximum distance defining a maximum diameter of said insert;

said first radius of curvature and said second radius of curvature being from about $D/(32\times1.375)$ inches to about $3D/(32\times1.375)$ inches, wherein D is said maximum diameter of said insert;

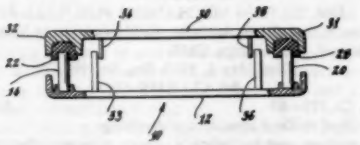
said first side surface, said first end surface, and said first top surface, and corresponding said second side surface, said second end surface, and said second top surface being symmetrical about said central axis; said first radius of curvature and said second radius of curvature of said mine tool roof bit insert being sufficient to decrease maximum wear of said mine tool roof bit insert generated by drilling holes in a mine roof utilizing said mine tool roof bit insert.

4,489,797

RESILIENT MOUNTED MULTIPLE LOAD ELEMENT WEIGH SCALE

Arnold S. Gordon, Woodmere, N.Y., assignor to Circuits & Systems, Inc., East Rockaway, N.Y.

Filed Feb. 7, 1983, Ser. No. 464,657
Int. Cl.³ G01G *21/00, 23/06*
U.S. Cl. 177—128 **20 Claims**



1. A weighing scale comprising:

a platform having one or more receiving members arranged to receive one or more decoupling members;

a base;

one or more load cells attached to said base; and

one or more resilient decoupling members wherein each of said one or more decoupling members both circumscribes the top end of said load cells and engages one of said receiving members of said platform such that said receiving member circumscribes at least part of said decoupling member, such that vertical forces applied to said platform

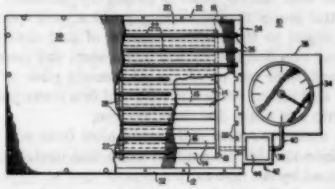
are measured by said one or more load cells while non-vertical forces are decoupled.

4,489,798

WEIGHT MEASURING APPARATUS WITH WEIGHT DISTRIBUTED ALONG AN ARRAY OF LONGITUDINAL AXES

Narendranath Menon, Arlington, Tex., assignor to General Electrodynamics Corp., Arlington, Tex.

Filed Apr. 29, 1983, Ser. No. 490,118
Int. Cl.³ G01G 5/04
U.S. Cl. 177—209 **20 Claims**



1. An apparatus for measuring weight comprising:
a base;
a plurality of longitudinal channels disposed in said base;
means for connecting said channels together to allow them to communicate as a common reservoir;
said channels and said connecting means having a fluid disposed therein;
a layer of deformable material having an elastic constant, said deformable layer disposed over each of said channels to define a sealed volume therein;
a load bearing layer of material disposed over said channels for receiving the weight;
a plurality of longitudinal force transferring members disposed on the surface of said elastic layer, each of said longitudinal members associated with one of said longitudinal channels and oriented with respect to the associated one of said longitudinal channels such that force applied to said member is transferred to said elastic layer and concentrated along the central axis of the associated one of said longitudinal channels;
means for aligning said longitudinal members along said longitudinal channels such that the distance between adjacent ones of said longitudinal members is essentially constant for all of said longitudinal members, said aligning means defining the relative position of the concentrated force from said longitudinal members on the surface of said deformable layers with respect to the longitudinal axis of said channels; and
means for measuring volumetric displacement of said longitudinal channels as a function of deformation of said deformable layer resulting from weight applied to said load bearing layer.

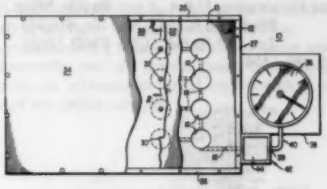
4,489,799

WEIGHT MEASURING APPARATUS WITH A DISTRIBUTED ARRAY OF SPRING ELEMENTS

Narandranath Menon, Arlington, Tex., assignor to General Electrodynamics Corp., Arlington, Tex.

Filed May 23, 1983, Ser. No. 496,903
Int. Cl.³ G01G 5/04
U.S. Cl. 177—209 **21 Claims**

1. An apparatus for measuring weight, comprising:
a base having an upper planar surface;
a plurality of wells formed in the planar surface of said base;
channel means for fluid communication with all of said wells;
a layer of elastically deformable material disposed on the upper planar surface of said base and covering said wells, said deformable layer sealingly attached to the planar surface of said base around the perimeter of said wells, said wells and the portion of said deformable layer disposed thereover defining a plurality of deformable chambers;
said deformable chambers and said channel means filled with a fluid;
means for receiving the weight to be measured and distributing and concentrating the received weight to the portion



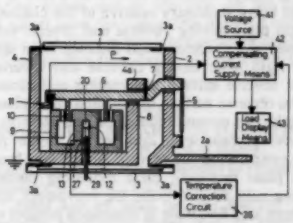
of said deformable layer proximate the center of each of said wells, said receiving means deforming each of said deformable chambers to cause a volumetric displacement therefrom to said expansion means; and
means for measuring a physical characteristic of said fluid in said deformable chambers as a function of the deformation of said deformable chambers resulting from the weight applied to said receiving means and converting the measured physical characteristics into a measurement of the weight received.

4,489,800

TEMPERATURE-COMPENSATED WEIGHING APPARATUS

Bruno Nufer, Zürich, and Paul Lüchinger, Uster, both of Switzerland, assignors to Mettler Instrumente AG, Greifensee, Switzerland

Filed Jul. 27, 1983, Ser. No. 517,640
Claims priority, application Switzerland, Aug. 20, 1982, 4976/82
Int. Cl.³ G01G 3/18, 7/02
U.S. Cl. 177—212 **5 Claims**



1. In a weighing apparatus of the load-compensation return-to-zero type including a stationary permanent magnet (9) mounted on a frame (4), a load carrier (2) connected for movement between no-load and load positions relative to the frame, a compensation coil (10) connected with the load carrier for movement in the magnetic field of the permanent magnet, means responsive to the displacement of the load carrier fron the no-load position for supplying to the coil compensating current of a magnitude to return the carrier to the no-load position, and temperature compensating means (26) including a temperature sensor (27) arranged within a bore (12) contained in the permanent magnet for varying the magnitude of the compensating current;
the improvement wherein said compensating current supply

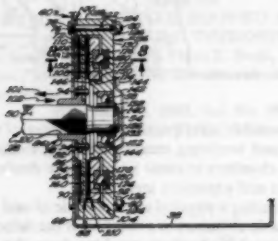
means includes at least one non-sensing component (20) that is arranged in temperature-responsive relation within a bore contained in said permanent magnet, whereby the necessity for further temperature compensation means for the components of the compensating current supply means is avoided.

4,489,801

BRAKING ASSEMBLY FOR A SNOWMOBILE

Gregory J. Marier, Forest Lake, Minn., assignor to Yamaha Motor Corporation, U.S.A., Coon Rapids, Minn.

Filed Sep. 9, 1982, Ser. No. 416,343
Int. Cl.[3] B62M 27/02; F16D 55/16
U.S. Cl. 180—190 5 Claims



1. A braking assembly aselectively actuatable by an operator and usable with a snowmobile having a chassis, an endless track rotatably supported by the chassis, and an engine mounted to the chassis and including an engine crankshaft, such braking assembly comprising:

a drive shaft having a longitudinal axis and mechanically connectable with the engine crankshaft and with the endless track, said drive shaft being rotatably mountable relative to the chassis for rotational movement about said longitudinal axis in a first rotational direction associated with forward movement of the snowmobile;

a brake disc having a central axis and obverse and reverse faces and mounted coaxially on said drive shaft for fixed rotation therewith, said disc being slidable along said drive shaft;

first brake pad means mountable to the chassis and positioned to closely confront said obverse face of said brake disc and being stationary relative to the chassis;

a first rigid plate having obverse and reverse surfaces and positioned at a predetermined distance from said disc;

a second rigid plate having obverse and reverse surfaces with its reverse surface confronting and closely spaced from the obverse surface of said first rigid plate;

second brake pad means mounted on said obverse surface of said second plate with said second brake pad means closely confronting the reverse face of said brake disc;

said first plate including plate mounting means slidably mounting said second plate for movement toward and away from said first plate in directions parallel to said axis of said drive shaft between a rest position, wherein said second brake pad means is spaced from said brake disc, and a braking position, wherein said second brake pad means contacts said brake disc and cooperates with said first brake pad means to grip said brake disc therebetween;

said plate mounting means swingably mounting said second plate for angular displacement about said longitudinal axis of said drive shaft between said rest position and said braking position;

control means extending between said second plate and the chassis and actuatable by the operator to produce angular displacement of said second plate from said rest position to said braking position;

said confronting surfaces of said first and second plates each having a pair of spaced apart slots, each said slot having a shallow region and a deep region with a slot floor joining said shallow and deep regions and said first and second plates positioned with said deep regions of said slots on said first plate confronting and communicating with said deep regions of said slots on said second plate when said second plate is in said rest position, and said shallow regions of said slots confronting and communicating with each other when said second plate is in said braking position;

a pair of rigid spacer balls, with one of said spacer balls being confined in each pair of confronting, communicating slots so that when said second plate is in said rest position, said spacer balls are substantially within said deep regions with said first and second plates closely adjacent each other and when said second plate is swung by actuation of said control means to said braking position, said spacer balls are urged to the shallow regions of said slots thereby urging said first and second plates apart and causing said second brake pad means on said second plate to contact said disc and to cooperate with said first brake pad means to grip said brake disc therebetween;

spring means to return said second plate from said braking position to said rest position when said control means is released by the operator;

said drive shaft including a central segment having a substantially hexagonal cross section and further including a pair of end segments at opposite ends of said drive shaft, each said end segment being adjacent said central segment and having a substantially round cross section; and

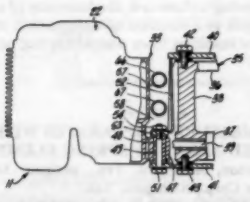
said brake disc including a central hub extending along said central axis of said disc and having a central hexagonal cross section aperture mounted on said central segment of said drive shaft, said hub extending laterally from said brake disc along said drive shaft toward said first brake pad means.

4,489,802

EXHAUST SYSTEM FOR MOTORCYCLES

Yoshiharu Isaka, and Yukiharu Hosoi, both of Shizuoka, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Nov. 22, 1982, Ser. No. 443,535
Claims priority, application Japan, Nov. 30, 1981, 56-192260
Int. Cl.[3] B62D 61/02
U.S. Cl. 180—219 14 Claims



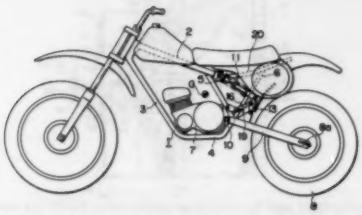
1. In a motorcycle of the type having frame means, an engine with at least one cylinder having an exhaust port opening in the rearward direction of the motorcycle and a crankcase assembly having a longitudinally extending mounting projection for supporting said engine from said frame means and a recessed portion adjacent said mounting projection and defining an opening with said frame means, the improvement comprising an exhaust pipe extending from said exhaust port through said crankcase recessed portion and said opening.

4,489,803

REAR SUSPENSION SYSTEM FOR MOTORCYCLES

Kiyoshi Fukuchi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 426,258
Claims priority, application Japan, Oct. 14, 1981, 56-163947
Int. Cl.³ B62K 25/20
U.S. Cl. 180—227 4 Claims



1. In a rear suspension system for motorcycles comprising a chassis frame of said motorcycle, a rear wheel, a member supporting said rear wheel at its rear end and pivotally connected to said chassis frame at its front end in such a manner as to permit oscillation thereof in upward and downward directions, a damper having one end connected to said chassis frame, a first link connecting the other end of said damper to said rear wheel supporting member, and a second link connecting said first link to said chassis frame, the improvement wherein:

said first link is arranged such that a longitudinal axis of said first link at its side extends substantially in a vertical direction;

said first link and said second link are arranged such that a line led from a first connecting part (O) between said chassis frame and said rear wheel supporting member to a second connecting part (C) between said first link and said rear wheel supporting member is substantially parallel at its side with another line led from a third connecting part (A) between said chassis frame and said second link to a fourth connecting part (B) between said first and second links;

said damper, said first link and said second link are disposed above a line extending between said first connecting part and the rear end of said rear wheel supporting member;

said damper is pivotally connected at the front end thereof to said chassis frame, extends rearwardly downwardly, and is pivotally connected at the rear end thereof to the upper end of said first link at a fifth connecting part (D);

said second link is pivotally connected at the front end thereof to said chassis frame at said third connecting part, and is pivotally connected at the rear end thereof to a substantially intermediate part of said first link at said fourth connecting part; and

said first link is pivotally connected at the lower end thereof to said rear fork at said second connecting part.

4,489,804

STRAP RETRACTOR ASSEMBLY

Ken Kamijo, Zushi, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 11, 1983, Ser. No. 457,129
Claims priority, application Japan, Feb. 23, 1982, 57-27597
Int. Cl.³ B60R 21/10
U.S. Cl. 180—268 6 Claims

1. A strap retractor assembly for use in a vehicular seat belt arrangement including an elongated flexible retaining strap to be fitted to an occupant of a seat structure in a vehicle body, comprising

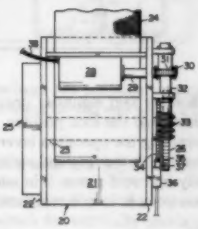
a reel shaft rotatable about an axis fixed with respect to the vehicle body and having said retaining strap anchored thereto at one end of the strap;

a drive motor operable for driving the reel shaft for rotation about said axis in a direction to have the retaining strap unwound from the reel shaft and in a direction to have the retaining strap re-wound on the reel shaft;

a combination of gears mechanically intervening between the reel shaft and the drive motor for transmitting a driving power from the drive motor to the reel shaft;

pulse generating means operative to produce first pulses in response to rotation of the reel shaft in one direction about said axis and second pulses in response to rotation of the reel shaft in the other direction about said axis;

resettable pulse counting means operative to count said first pulses forwardly and said second pulses backwardly and to produce an information signal representative of the number of the pulses counted;



reference signal generating means responsive to a variable parameter and operative to produce a reference signal which is variable with said parameter and which is representative of a number of pulses corresponding to a desired degree of slackness of the retaining strap;

comparing means operative to compare the number of the pulses represented by said information signal with the number of pulses represented by said reference signal and to produce a signal when the number of the pulses represented by the information signal is in a predetermined relationship to the number of pulses represented by the reference signal; and

a signal processing network operative to process the signals and pulses delivered from said pulse generating means and comparing means and to produce, on the basis of the output signal from the comparing means, a control signal to actuate said drive motor into operation driving the reel shaft in either direction about the center axis thereof.

4,489,805

UNIVERSAL LEVER APPARATUS FOR HYDRAULIC CONSTRUCTION MACHINE

Nobuya Okabe, Tsuchiura, Japan, assignor to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

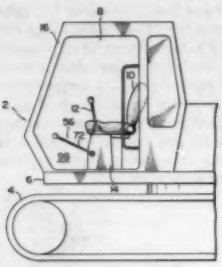
Filed Apr. 18, 1983, Ser. No. 486,117
Claims priority, application Japan, Apr. 21, 1982, 57-65401
Int. Cl.³ B60K 28/00
U.S. Cl. 180—271 10 Claims

1. A universal lever apparatus comprising a first rod and a second rod each for actuating an operated member, an operation lever connected to the first rod and the second rod and pivotally movable in a first direction for moving the first rod and in a second direction for moving the second rod, and lock means for locking the operation lever, said lock means comprising:

manually operated means operatively connected to the operation lever for pivotally moving the operation lever to a rearward position in which the operation lever does not interfere with movement of a driver without causing effective movements of the first and second rods, said manually operated means being movable between an

unlock position in which the pivotal movement of the operation lever causes the effective movements of the first and the second rods and a lock position in which the operation lever is located in the rearward position;

means associated with said manually operated means for



resiliently holding said manually operated means in said unlock position and the lock position; and

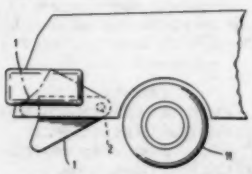
means for restraining the operation lever to keep same from pivotally moving in the first and second directions when said manually operated means is in said lock position and the operation lever is in said rearward position.

4,489,806

DEVICE FOR RAISING AND LOWERING AN AIRFOIL

Masao Shimomura, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 27, 1983, Ser. No. 489,148
Claims priority, application Japan, May 6, 1982, 57-75757
Int. Cl.³ B62D 37/00
U.S. Cl. 180—903 5 Claims



1. A device for raising and lowering an airfoil mounted on a lower portion of a vehicle body, comprising:

(a) a driving mechanism for driving the airfoil upwardly and downwardly;

(b) an electric device for actuating said driving mechanism;

(c) a vehicle height detector for detecting the height of the vehicle body with respect to an axle;

(d) an airfoil height detector for detecting the height of the airfoil with respect to the vehicle body; and

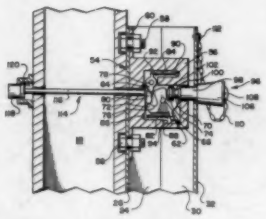
(e) a control unit responsive to the vehicle height as detected by said vehicle height detector, the airfoil height as detected by said airfoil height detector, and the speed of travel of the vehicle body for actuating said electric device to lower the airfoil when said speed exceeds a predetermined level and the vehicle height is high.

4,489,807

CONTRACTIBLE ESCAPE LADDER

Ernest A. Rodriquez, 1258 Mt. Baker Hwy., Bellingham, Wash. 98225

Filed Oct. 12, 1982, Ser. No. 433,860
Int. Cl.³ E06C 9/00
U.S. Cl. 182—96 4 Claims



1. A contractible escape ladder for disposition outwardly proximate a wall of a building structure and deployment from a collapsed configuration to an escape configuration, comprising:

a. first and second ladder rail means each having a generally U-shaped channel configuration comprised of opposed rail channel members joined by a bridging member defining an interior rail channel width dimension, wherein said first ladder rail means is formed for affixation to an exterior wall of a building structure with said second ladder rail means in outwardly pivotal relationship therewith;

b. a plurality of ladder rung means pivotally disposed in an array between said ladder rail means and secured thereto at opposing ends thereof, each of said rung means having a generally U-shaped channel configuration comprised of opposed rung channel members joined by a bridging member defining an exterior rung chanel width dimension, wherein said rung channel width dimension is measurably less than said rail channel width dimension;

c. axle means disposed through said rail channel members and the opposed ends of said rung channel members pivotally joining same together, said axle means including rung spacer means for establishing and maintaining a gap region intermediate the interior faces of said rail channel members and the exterior faces of said rung channel members; and,

d. latching means for maintaining said ladder rail means juxtaposed in a collapsed configuration, operable to release said rail means for pivotal rotation about said rung means to an escape configuration from a location interiorly of said building while being secure from a location exteriorly thereof;

wherein said latching means includes overcenter latch means secured to said first ladder rail means for captured receipt of biased latch plug means having a shank disposed through said second ladder rail means to maintain said rails in said collapsed configuration and latch release means in operative engagement with said overcenter latch means across said wall, and further wherein said biased latch plug includes a biasing member urging said plug outwardly of said overcenter latch means and said second rail while sealing said shank against said second ladder rail means.

4,489,808

COLLAPSIBLE SAWHORSE

Bradford D. Voye, 4725 Prinston Dr., Corpus Christi, Tex. 78411

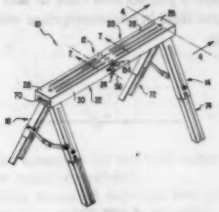
Filed Oct. 24, 1983, Ser. No. 544,521
Int. Cl.³ F16M 11/00
U.S. Cl. 182—155 9 Claims

1. A collapsible sawhorse comprising

a beam for supporting a load including first and second

sections pivoted together for movement between a first position in which an upper surface of the sections are coplanar and a second position in which the upper sections are parallel;

two pairs of legs, at opposite ends of the beam, for supporting the beam in the first position thereof; and



means pivotally connecting each pair of legs to the beam for movement between a first load supporting position and a second position parallel to the beam sections, including

means mounting each leg for pivotal movement toward the other leg of its pair; and

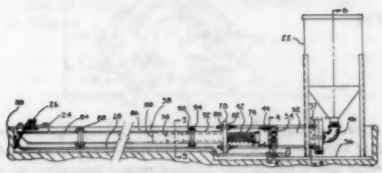
means mounting each pair of legs for pivotal movement about an axis perpendicular to the upper section surface.

4,489,809

RAILROAD TRACK DEFLECTION ACTIVATED GREASE PUMP

John A. Wade, 13611 W. 95th St., Lenexa, Kans. 66215

Filed Jan. 3, 1983, Ser. No. 455,290
Int. Cl.³ B61K *3/00*
U.S. Cl. 184—3.1 **25 Claims**



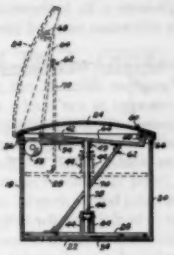
1. A grease pump for railroad tracks adapted to be actuated by rail deflection caused by rail traffic, said pump comprising a source of grease, a stationary pump housing having a horizontally extending axis, said housing having an inlet port communicating with the grease source, an outlet port in said housing communicating with a grease lubricator means for applying grease to a portion of said railroad track and pump operating means connected to a rail of said track and said grease pump housing for forcing grease through said outlet port, said inlet and outlet ports being vertically spaced from one another, said pump housing comprising a grease reservoir bridging and extending between said inlet port and said outlet port and said operating means comprising a moveable pressure member forming a vertically extending front wall of said reservoir, said operating means further comprising a horizontally extending rigid operating means connecting said rail with said pressure member and being responsive to deflections in the rail to oscillate said pressure member back and forth across the axis of the housing and effect a pumping action on grease in said reservoir and force it through said outlet port.

4,489,810

RECESSED GARBAGE CAN CONTAINER

Joel E. Curtis, 306 Christopher, Chickasha, Okla. 73018

Filed Aug. 19, 1983, Ser. No. 524,490
Int. Cl.³ B65D *43/26, 88/54, 9/00*
U.S. Cl. 187—3 **3 Claims**



1. A concealed garbage can container, comprising:

an upwardly open housing having end walls, a bottom wall and a hinged lid;

platform means within said housing normally disposed adjacent the bottom wall for supporting at least one refuse container;

means including a winch for vertically moving said platform;

guide means for maintaining said platform parallel with said bottom wall during vertical movement,

said guide means including a pair of spaced-apart upright parallel standards secured to said housing bottom wall,

a cross brace extending between the upper limit of said standards,

guide means on said platform engaging said standards for guiding said platform during vertical movement,

block and tackle means extending between said brace and the platform, and,

a motor driven winch connected with the block and tackle means; and,

link means for raising and lowering said lid in response to vertical movement of said platform,

said link means including an arm pivotally connected at one end with one of said end walls adjacent the hinged connection of said lid and projecting toward the opposite limit of said lid,

a wheel journalled by the other end portion of said arm, and,

a leg extending between and pivotally connected at its respective end portions with said arm and said platform.

4,489,811

APPARATUS FOR DECELERATING ELEVATOR AT TERMINATING FLOOR

Masashi Yonemoto, Nagoya, and Ryuichi Kajiyama, Inazawa, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

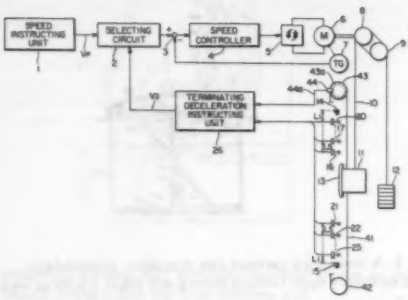
Filed Feb. 7, 1983, Ser. No. 464,668
Claims priority, application Japan, Feb. 8, 1982, 57-18350
Int. Cl.³ B66B *1/30*
U.S. Cl. 187—29 R **9 Claims**

1. An apparatus for decelerating an elevator at a terminating floor having a plurality of terminating detectors successively provided in the vicinity of the terminating floor for generating a terminating deceleration command value gradually decreasing upon operation of the detectors when the cage of the elevator approaches the terminating floor which comprises:

a pulse generator which generates pulses corresponding in number to a moved distance of the cage;

memories which store distances from the terminating floor to respective terminating detectors;

a counter in which the distance information of one of the memories is preset in correspondence with the operation of one of said plurality of terminating detectors when the cage starts an ascending or descending operation, and thereafter the distance information of the memory corresponding to another of said terminating detectors is set when said another terminating detector operates, and



which is supplied with said pulses when said one terminating detector detects the presence of the cage, to count said pulses and to subtract the count value from the set value; and

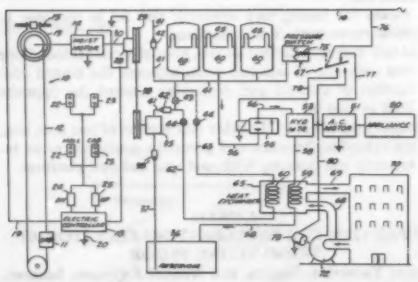
a distance-to-speed converter which calculates the terminating deceleration command value corresponding to the output of said counter.

4,489,812

POWER RECOVERY SYSTEM AND METHOD FOR ELEVATOR APPARATUS

Loren B. Ferris, 5344 Tyler Ave., Arcadia, Calif. 91006

Filed Jul. 22, 1983, Ser. No. 516,031
Int. Cl.³ F03B *13/00*
U.S. Cl. 187—29 R **15 Claims**



1. That improvement in elevator apparatus of the type having power driven means for operating a load lifting device between different floor levels which improvement comprises:

power recovery means for recovering energy from said elevator apparatus during travel of said load lifting device including:

hydraulic pump means having a driving connection to said power driven means for said load lifting device operable to drive said pump means during travel of said load lifting device in at least one direction of travel thereof;

hydraulic fluid accumulator means connected by a conduit to the outlet of said pump means and including means to prevent reverse fluid flow through said pump means when said pump means is not driven;

electric motor driven means normally connected to an electric power source;

hydraulic motor means having a driving connection to said electric motor operable in an idling condition while said electric motor is electrically driven; and

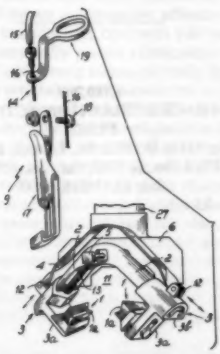
means responsive to a predetermined pressure in said accumulator means to deactivate said electric motor and to supply pressurized fluid to said hydraulic motor means from fluid in communication with said accumulator means.

4,489,813

PADDED SHOE BRAKE, PARTICULARLY FOR BICYCLES

Franco Albonico, Como, Italy, assignor to Meccanotex S.p.A., Lurago D'Erba, Italy

Filed Feb. 2, 1982, Ser. No. 345,115
Claims priority, application Italy, Feb. 3, 1981, 19480 A/81
Int. Cl.³ B60T *1/06*; B62L *1/06*
U.S. Cl. 188—24.21 **13 Claims**



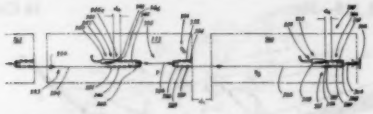
1. A padded shoe brake particularly for bicycles, comprising a pair of shoe pads adapted to frictionally engage a wheel rim, and shoe pad control and guiding means operative to move said shoe pads to and from said wheel rim while maintaining said shoe pads at a position of substantial symmetry with respect to said wheel rim, wherein

said shoe pads have a rim-contacting surface of hollow shape and adapted to continuously encompass both sides and an inner annular portion of said wheel rim, said control and guiding means being mechanically structured to bring said shoe pads closer to said wheel rim along paths substantially terminated between said sides and inner annular portions of said wheel rim, and wherein said control and guiding means comprise two guiding arms located adjacent one section of a wheel and extending obliquely between the direction of the wheel axis and the plane containing said wheel, as well as being convergent toward each other such as to define a seat substantially accommodating said wheel section, two slider supports slidably mounted on said arms and engaging said shoe pads at a position facing said wheel rim, and control elements adapted to symmetrically drive said slider supports along said arms, so as to move said shoe pads into and out of engagement with said wheel rim.

4,489,814
HAND BRAKE ARRANGEMENT

Arthur C. Pearson, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 2, 1982, Ser. No. 404,120
Int. Cl.³ B61H 13/26, 13/02
U.S. Cl. 188—33 28 Claims



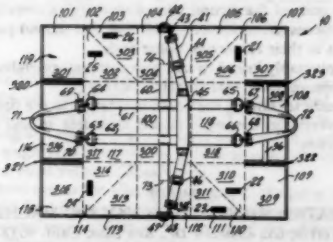
1. A hand brake assembly for use with separate railway cars or articulated car units comprising:

a wheel assembly mounted adjacent one end of a first car; means connecting said wheel assembly to a first force dividing means located on the first car which divides the applied hand brake force into first and second hand brake linkages; each having a reduced hand brake force; said first hand brake linkage connected to a first air brake linkage means located on the first car; whereby when the hand brake is applied, said first hand brake linkage is effective to apply the brakes on the first car or unit through said first air brake linkage; said second hand brake linkage extending from one car to a second adjacent car; means connecting said second hand brake linkage to a force multiplying means provided on the second car which increases the and brake force of the second hand brake linkage to a level sufficient to apply the brakes on the second car through a second air brake linkage means located on the second car.

4,489,815
PICNIC BAG AND MAT

Isidro A. Martinez, 4330 NW. 196th St., Coral City, Fla. 33055, and Beatriz Gutierrez, 3100 SW. 67th Way, Miramar, Fla. 33023

Filed Jun. 9, 1983, Ser. No. 502,759
Int. Cl.³ A45C 7/00, 9/00, 11/20; B65D 5/36
U.S. Cl. 190—1 4 Claims



1. A mat comprising, in operative combination:

a. a rectangular bottom panel having a front, a rear and two lateral edges;

b. a pair of square end panels joined to said front and rear edges;

c. a pair of rectangular lateral panels, having the same dimensions of said rectangular bottom panel, each joined along one of its long edges to said lateral edges;

d. a pair of rectangular top panels, having substantially the same dimensions of said rectangular bottom panel, each joined along one of its long edges to the other long edge of each of said rectangular lateral panel;

e. four pairs of triangular panels, wherein each pair forms a square that is joined to one of said square end panels on one side and to the shortest edge of one said lateral panels on the other side so that each triangular pair is positioned on each of the corners of said rectangular bottom panel;

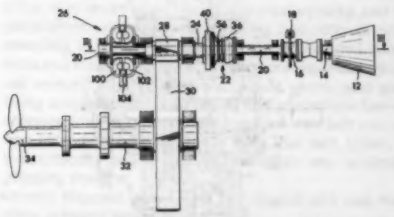
f. four flat corner panels adjacent at one edge to one of the shortest edges of said rectangular top panels and the other edge adjacent to one of the edges of an adjoining triangular panel and said corner panels positioned so that a large substantially square mat configuration is completed; all of said panels are comprised of a semi-rigid material and wherein said panels have an underside and overside surface;

g. a plurality of Velcro fastener means mounted, in complementary sets, on the overside surfaces of two pairs of triangular panels which are at opposite corners of said bottom rectangular panels, on the overside of one of said top panels, on the underside surface of the other set of two pairs of said triangular panels which are at the opposite corners of said bottom rectangular panel, on the underside surfaces of the one of each of said other set of two pairs of said triangular panels which is joined to said lateral panels, and on the underside of the other said top panels and adapted to hold said device in a box-shape when folded.

4,489,816
CLUTCH ARRANGEMENT FOR A MARINE VESSEL DRIVE

Hans Sigg, Mutschellen, Switzerland, assignor to MAAG Gear-Wheel & Maschine Company Limited, Zurich, Switzerland

Filed Apr. 1, 1982, Ser. No. 364,424
Claims priority, application Switzerland, Apr. 13, 1981, 2431/81
Int. Cl.³ F16D 47/06, 39/00, 11/10, 23/10
U.S. Cl. 192—3.23 10 Claims



1. A clutch arrangement for a marine vessel drive comprising:

a normally driving first drive shaft;

a normally driven second shaft;

a synchronizing tooth clutch;

a fluid flow device having a primary part and a secondary part;

said tooth clutch having a first tooth clutch half located at a drive side and a second power take-off tooth clutch half located at a driven side;

said first shaft being connected with said drive-side first tooth clutch half of the synchronizing tooth clutch and with the primary part of the fluid flow device and with said normally driven second shaft;

said normally driven second shaft being connected with the power take-off side tooth clutch half of the tooth clutch and with the secondary part of the fluid flow device;

said tooth clutch possessing a clutch star;

said clutch star having a first set of teeth;

said clutch star being axially displaceable by means of the first set of teeth upon one of the tooth clutch halves by continuous meshing of the teeth;

said clutch star being provided with a second set of teeth for enabling engagement of the clutch star with the second tooth clutch half;

a pawl blocking device supported by said clutch star;

said pawl blocking device upon passing through a synchronous rotational speed engaging and causing a screw-like relative movement between two components of the tooth clutch which causes the engagement of the clutch star;

the first set of teeth of the clutch star comprising straight teeth;

a screw socket threadably connected with the second tooth clutch half;

said screw socket and said pawl blocking device being connected as a unit with the clutch star for conjoint axial displacement;

a servomotor controlled by the screw socket for continuing the engaging movement of the clutch star;

means connecting the screw socket with said servomotor; and

said pawl blocking device being arranged such that it engages when the rotational speed of the drive-side first tooth clutch half, during normal forward direction of rotation is about to drop below the rotational speed of the power take-off side second tooth clutch half.

4,489,817

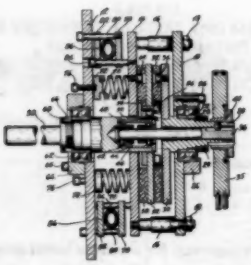
CLUTCH BRAKE ASSEMBLY

Pierre Gagnon, 5635 Wilderton Ave., Montreal, Canada (H3T 1S1), and Pierre Laforest, 1945 Bruxelles St., Montreal, Canada H1L 5Z5

Filed Jul. 24, 1980, Ser. No. 172,003

Int. Cl.³ B60K *41/24*; F16D *25/08*

U.S. Cl. 192—18 A **7 Claims**



1. A clutch brake assembly for coupling a load to a motor, said clutch brake assembly comprising:

(a) a main body;

(b) an input shaft rotatably mounted on said main body;

(c) a drive disc mounted on said input shaft;

(d) an output shaft mounted for rotation and for a limited axial movement on said main body;

(e) a driven disc mounted on said output shaft;

(f) a first friction shoe mounted on said main body facing one face of said driven disc;

(g) a second friction shoe mounted on said drive disc facing the other face of said driven disc;

(h) biasing means mounted on said main body for biasing said driven disc into engagement with said first friction shoe;

(i) a flexible conduit containing a fluid; and

(j) means for mounting a portion of said flexible conduit on said main body, whereby expansion of said flexible conduit portion, when the fluid present in said conduit portion is pressurized, will cause movement of said driven disc from engagement with said first friction shoe into engagement with said second friction shoe, thereby coupling the motor to the output shaft.

4,489,818

CROSS-PIT CONVEYOR

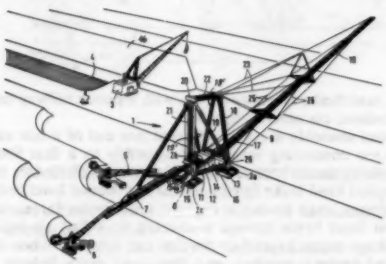
Rudiger Franke, Mettmann, and Aby Weiss, Monheim, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 2, 1983, Ser. No. 471,396

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207419

Int. Cl.³ B65G *41/00*

U.S. Cl. 198—311 **14 Claims**



1. Cross-pit conveyor for strip-mining operations and cooperating with one or more excavating machines, comprising:

a pair of struts and a base strut, all arranged and interconnected in a configuration constituting a horizontally oriented isosceles triangle, the struts of the pair constituting the legs and defining the principal corner of the triangle as well as a line of symmetry of the triangle, there being two additional corners at the ends of the base strut;

a plurality of undercarriage means disposed respectively in the corners of the triangle for movably but separately supporting the struts;

a first pair of upwardly converging towers, pivotably linked to said base and corners and constituting a first structure;

a second pair of upwardly converging towers extending from the said base corners but in an inclined fashion, and constituting a second support structure;

a vertical support tower extending generally upwardly from said principal corner and being on its upper end connected to the ends of the second pair of converging towers;

tension means interconnecting the first and second pairs of towers at their respective upper ends;

a boom pivotably linked to said base strut and extending in a direction opposite that principal corner;

cable means tensioning the boom in relation to the first pair of towers; and conveyor means extending in and along said boom.

4,489,819

PNEUMATIC GRIPPER FOR A NAILING MACHINE

Lloyd E. Perrin, 652 Choctaw Dr., San Jose, Calif. 95123, and Donald H. Cronquist, Jr., 4300 Albany Dr., #230, San Jose, Calif. 95129

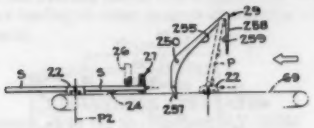
Filed Feb. 20, 1981, Ser. No. 236,469

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—403 **5 Claims**

1. In combination, a gripper carriage having a pair of gripper heads, each head having an expansible chamber and an article-gripping unit movable into gripping engagement with an article upon expansion of said chamber, means for reciprocating said carriage between an article-pickup area and an article-discharge area, means for charging said gripping heads and expanding said chambers when said carriage is at the article-pickup area, means on the gripping heads to maintain the charge of air as the carriage travels between the article-pickup area and the article-discharge area, a rotatable member on the

carriage carrying the gripping heads and mounted on the carriage for turning movement to rotate the articles about a horizontal axis while being gripped and on said carriage, said rotatable member having a forward and a rearward article gripping unit each of which is concurrently operable to grasp an article with one gripped article leading in a forward direction and with the other gripped article trailing, and means at



the article discharge area to operate said means on the gripping heads for releasing the pressure in said forward gripping unit to release the forward article when said carriage is at the discharge area whereby upon return movement toward the article-pickup area the trailing article may be inverted to become the leading article for subsequent release when the gripping unit returns to the article-discharge area.

4,489,820

METHOD AND APPARATUS FOR TRANSFERRING BOTTLES ARRIVING IN UPRIGHT POSITION IN LATERALLY ADJACENT ROWS ON A FEED CONVEYOR INTO A SINGLE ROW OF BOTTLES ON A DOWNSTREAM CONVEYOR

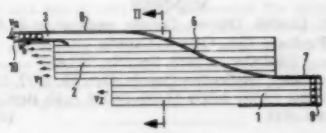
Egon Schneider, Neutraubling, Fed. Rep. of Germany, assignor to KRONES AG Hermann Kronseder, Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Jan. 7, 1983, Ser. No. 456,208

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, 3202991

Int. Cl.³ B65G *47/26*

U.S. Cl. 198—448 **13 Claims**



8. An apparatus for transferring bottles arriving in an upright position and in laterally adjacent rows on a feed conveyor traveling at a first velocity across an intermediate conveyor traveling at a second velocity faster than said first velocity and into a single row of bottles on a downstream conveyor traveling at a third velocity, comprising:

support means for effecting a tilting of the plane of each of said feed conveyor, said intermediate conveyor and said downstream conveyor in the same direction and to a sufficient angle to cause the standing bottles to slide laterally down the slope of said conveyors as said bottles are conveyed in a direction toward and along said downstream conveyor;

support rail means oriented along a lower portion of each of said feed conveyor, said intermediate conveyor and said downstream conveyor for continuously passively guiding the lowermost ones of said bottles on each of said conveyors so as to keep them in said upright position, the difference in speed between at least said feed conveyor and said intermediate conveyor causing spaces to occur at least between mutually adjacent bottles engaging said support rail means, the bottles which are still at a higher position on said conveyors being accelerated with some delay and slide laterally into said spaces as they become formed while other bottles are continuously passively supported in wall-to-wall contact with each other on the next lower ones of said bottles on each of said conveyors as all of said bottles continue to move to said downstream conveyor.

4,489,821

WORKPIECE FEEDER

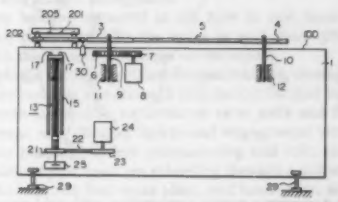
Hajimu Inaba, Hino, and Nobutoshi Torii, Hachioji, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jun. 21, 1982, Ser. No. 390,658

Claims priority, application Japan, Jun. 29, 1981, 56-99741

Int. Cl.³ B65G *37/00*

U.S. Cl. 198—472 **5 Claims**



1. An apparatus for successively feeding workpieces to a workpiece gripping position of a hand of an industrial robot, comprising:

a frame;

a table mounted on said frame;

an endless conveyor mounted on said table and having a plurality of movable pallets interspaced from each other at equal distances, each of said pallets having a lower plate and an upper plate detachably mounted on said lower plate, said lower plate having a central opening and two projections, said upper plate having two recesses corresponding to said projections, or vice versa, said projections and recesses being disposed on corresponding diagonal corners of said upper and lower plates, said plates being coupled together by fitting said projections into said recesses, said conveyor having at least one belt run portion extending over said table such that said pallets are intermittently moved one by one under said workpiece gripping position;

a window disposed in said table and aligned with said workpiece gripping position; and

a lifting means movable vertically through said window in the table and said central opening in the lower plate of a pallet to engage the upper plate of the same pallet from below, causing said upper plate to move and to lift a workpiece placed on said upper plate up to said workpiece gripping position, said lifting means comprising a lead screw provided rotatively on the machine frame, an electric motor rotating said lead screw normally and reversely, a nut screwed on said lead screw, a non-rotatable cylindrical body on which said nut is fixed, and a platform mounted on the top of said cylindrical body and led by a guide means provided on the machine frame, the top of said platform and the bottom of each of said upper plates having cooperative engaging means.

4,489,822

FRUIT CUP DAMPENING DEVICE

Jacob F. Hiebert, Reedley, Calif., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 19, 1983, Ser. No. 459,177

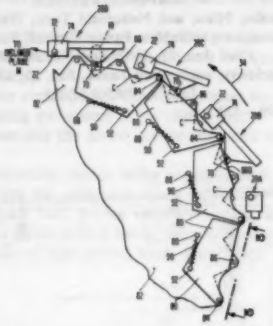
Int. Cl.³ B65G *47/84*

U.S. Cl. 198—478 **14 Claims**

1. Dampening device for article carrying cups employed in automatic apparatus comprising

first conveyance means for transporting articles in spaced disposition,

second conveyance means including carrying means, dampening means, and said article carrying cups, said carrying means moving a plurality of said article carrying cups into position for receiving said transported articles from said first conveyance means,



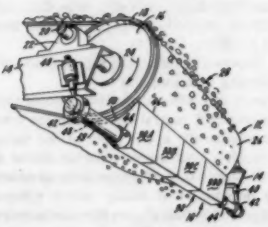
said dampening means cooperating with said moving cups when said transported articles are received thereinto including a plate pivotally mounted to said carrying means which is resiliently pivotally depressed by said cup when said article impacts said cup.

4,489,823

SCRAPER BLADE FOR A BELT CONVEYOR

James R. Gordon, 301 W. Boling, Benton, Ill. 62812

Filed Aug. 9, 1982, Ser. No. 406,366
Int. Cl.³ B65G *45/00*
U.S. Cl. 198—499 **4 Claims**



1. An improved scraper blade for a scraper employed to scrape particulate conveyed material from a belt conveyor, the scraper being of the kind comprising a scraper shaft having its opposite ends supported in a pair of tensioning supports located at opposite sides of a conveyor belt, the scraper shaft extending across the conveyor belt in spaced relation thereto, the improved scraper blade comprising:

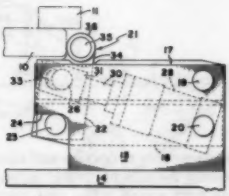
an elongated block of molded elastomer material mounted on the scraper shaft, the scraper blade having a leading edge extending across and engaging the conveyor belt at one transverse position and a trailing edge extending across and engaging the conveyor belt at a second transverse position spaced from the first position, the surface of the blade intermediate its leading and trailing edges comprising a shallow concavity spaced from the belt, the depth of the concavity being only sufficient to collect a limited quantity of particulate conveyed material therein.

4,489,824

APPARATUS FOR STOPPING ARTICLES ON A CONVEYOR

George Scourtes, Plymouth, Mich., assignor to The Allen Group Inc., Saginaw, Mich.

Filed Mar. 25, 1980, Ser. No. 133,804
Int. Cl.³ B65G *47/88*
U.S. Cl. 198—633 **20 Claims**



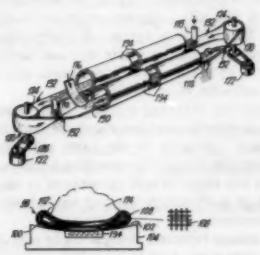
6. Apparatus for stopping an article movable along a path, said apparatus comprising a frame; stop means engageable with such article; means mounting said stop means on said frame for movements between a first position clear of said path and a second position in which said stop means projects into said path and is engageable by such article to arrest movement thereof; extensible and retractable fluid pressure ram means mounted on said frame; means coupling said ram means to said mounting means for effecting movements of said stop means between said position; yieldable means incorporated with said ram means enabling limited cushioned retraction of said ram means in response to initial engagement of said stop means with a moving article; and means operable to restore said ram means to its extended position following said limited retraction thereof, said limited retraction of said ram means being insufficient to effect movement of said stop means a distance sufficient to enable an arrested article to pass said stop means.

4,489,825

AIR FILM SUPPORTED AND GUIDED LOAD SUPPORT MEMBER

Herbert E. Gladish, Ottawa, Canada, assignor to E. B. Eddy Forest Products, Ltd., Ottawa, Canada

Filed Oct. 2, 1978, Ser. No. 947,435
Claims priority, application Canada, Oct. 19, 1977, 288996
Int. Cl.³ B65G *15/60*; B61D *15/00*; B60M *1/30*; B65D *19/18*
U.S. Cl. 198—811 **14 Claims**



1. A load supporting means for positioning between a load and a load supporting surface, said means being capable of supporting said load and of substantially isolating said load from forces influencing the position of said surface, said means comprising: a generally tubular outer member formed of a resilient partly deformable material capable of deformation under load and at least partial recovery under load removal; an annular deformable core extending generally axially within said outer member, creating an annular cavity between said

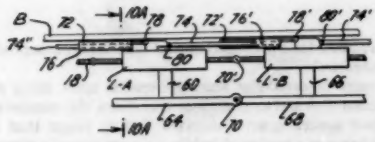
core and said outer member; a resilient deformable filler material substantially filling said cavity and being capable of deformation under load and at least partial recovery under load removal, said filler material and said outer member being sufficiently flexible so that at least said outer member can vibrate under the influence of high velocity fluids exitting from nozzles in said surface; and including an axially extending, laterally flexible, reinforcing arch member positioned within said core and exerting lateral forces against the wall of said core under loading to assist in stress distribution within said filler material.

4,489,826

ADJUSTABLE APPARATUS

Philip Dubson, 73-18 192 St., Flushing, N.Y. 11366

Filed Feb. 5, 1982, Ser. No. 346,017
Int. Cl.³ B65G *15/60, 21/14*
U.S. Cl. 198—812 **30 Claims**



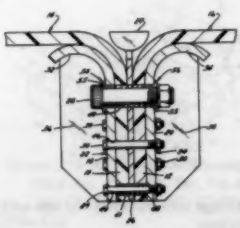
1. An articulated arm comprising a series of links, each of a plurality of said links having a base and first and second control units mounted thereon, the first control units of said links being connected in series with each other at respective first pivotal connections, the second control units of said links being connected in series with each other at respective second pivotal connections, said first and second pivotal connections being spaced apart along respective parallel axes, said first control unit of at least one of said links between adjacent links of the series being a first drive unit having coaxial first drive elements extending oppositely to respective ones of said first pivotal connections and extending along an axis fixed in relation to the base of said one of said links, and means for operating said drive elements of said drive unit along their axes simultaneously and equally in opposite directions relative to the base for thereby causing the links adjacent said one link to tilt in relation to said one link through angles in a first plane when said operating means operates alone.

4,489,827

MECHANICAL SPLICING APPARATUS AND METHOD

William B. Anderson, Oconomowoc, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Continuation of Ser. No. 263,628, May 14, 1981, abandoned. This application Aug. 1, 1983, Ser. No. 519,470
Int. Cl.³ B65G *15/30*
U.S. Cl. 198—844 **1 Claim**



1. A mechanical splice, comprising:

first and second outer plates, each of said outer plates comprising:

a flat portion having a length and an end and defining a plurality of non-collinear holes along said length, wherein said holes in said first outer plate correspond to said holes in said second outer plate;

a curved portion extending from said end of said flat portion; and

a brace connected to the curved portion and the flat portion of the outer plate and tending to stiffen the outer plate;

first and second flanged bushings mounted in corresponding holes in said first and second outer plates near said end;

an inner plate between said first and second outer plates, said inner plate having holes corresponding to the holes in said first and second outer plates;

a spacer bushing mounted in the hole in said inner plate which corresponds to the holes in said outer plates in which said flanged bushings are mounted;

a bolt placed through said first flanged bushing, through said spacer bushing, and through said second flanged bushing, wherein said bolt is tightened so as to push said flanged bushings into abutting end-to-end engagement with said spacer bushing, thereby pretensioning said bolt; and

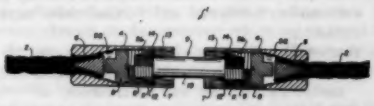
a plurality of pins, each pin extending through a corresponding hole in said first outer plate, said inner plate, and said second outer plate, the holes through which said pins extend being located more remotely from the end of the flat portion than the location of the holes in which the flanged bushings are mounted.

4,489,828

DEVICE FOR SPLICING CABLE ENDS

Gustaaf Stipdonk, Hilliard, Canada, assignor to Petro-Canada Exploration Inc., Calgary; Her Majesty the Queen in right of the Providence of Alberta, Alberta Oil Sands Equity, Edmonton; PanCanadian Petroleum Limited, Calgary; Esso Resources Canada Limited, Calgary; Canada-Cities Service, Ltd., Calgary; Gulf Canada Limited, Toronto; Alberta Energy Company, Ltd., Calgary; Hudson's Bay Oil and Gas Company Limited, Calgary and Petrofina Canada Inc., Calgary, all of, Canada

Filed Apr. 5, 1982, Ser. No. 365,583
Int. Cl.³ B65G *15/34*
U.S. Cl. 198—847 **4 Claims**



1. A connector for joining two cable ends in a conveyor belt comprising:

a pair of sleeves, each sleeve forming a longitudinal bore extending therethrough, said bore having an inner section of reduced cross-sectional area relative to the remainder of the bore, said bore being of sufficient cross-sectional area so that each sleeve can slip onto one of the cable ends to be joined;

a pair of wedge means, each adapted to be embedded in one cable end, once the sleeve has been slipped onto the cable end, to expand said cable end sufficiently so that the expanded end is small enough to enter the bore's outer section but is too large to pass through the bore's inner section, whereby each sleeve may be securely attached to one cable end; and

bridging means for interconnecting the sleeves, said bridging means comprising

rigid elongated first means extending between the sleeves,

second means for connecting one end of the first means with

one sleeve and enabling said first means to pivot relative to the longitudinal axis of said sleeve,

and third means for connecting the other end of the first means with the other sleeve and enabling said first means to pivot relative to the longitudinal axis of said sleeve,

whereby the bridging means is operative to hold the sleeves together in substantially aligned lineal relation while permitting the connector to flex, to a limited extent, when passing around a conveyor roll.

4,489,829

HANGING BAG WITH DETACHABLE COWL

Jay E. Myers, 353 Cedar Way, Apt. A, Laguna Beach, Calif. 92651, and M. Todd Myers, 205 W. 15th St., Apt. 4P, New York, N.Y. 10011

Filed Mar. 21, 1983, Ser. No. 477,151
Int. Cl.³ B65D *85/18*
U.S. Cl. 206—287 **11 Claims**

1. A garment bag comprising:

a vertically elongated main receptacle having generally rectangular, horizontal and vertical cross sections and including

rear wall panel means,

front wall panel means substantially parallel and spaced apart from said rear wall panel means,

peripheral wall means connecting said rear and front wall panel means at their corresponding edges,

zipper closure means running substantially vertically up said front wall panel means dividing said front wall panel means into two separable halves from the top to substantially the bottom thereof, said halves being affixed along their bottom edges and outside edges to said peripheral wall means, but being unattached along at least a portion of their top edges,

said receptacle being constructed of collapsable material and being vertically foldable such that when folded, an upper portion of said receptacle faces and is aligned with a lower portion thereof,

retaining means for securing said receptacle in folded position, cowl means for covering the upper edge of said front wall panel means, and

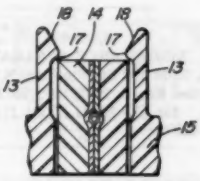
zipper means for detachably connecting said cowl means to said receptacle, said zipper means running along at least a substantial portion of the side edges and along the top edge of said cowl means, and along corresponding edge portions of said receptacle.

4,489,830

RETAINER FOR PACKAGED OPTICAL FIBER SPLICES AND ORGANIZING TRAY UTILIZING SUCH RETAINERS

Leonard J. Charlebois, Kanata; James R. Scott, Ashton, and Robert J. Barber, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 12, 1983, Ser. No. 560,541
Int. Cl.³ B65D *85/20, 85/62, 1/36*
U.S. Cl. 206—316 **10 Claims**



1. A retainer for a packaged optical fiber splice, comprising:

a bottom web;

two pairs of cantilever members spaced apart along said bottom web and extending up therefrom, the members of a pair spaced apart a distance slightly larger than the thickness of a packaged splice, the pairs spaced a distance less than the length of the packaged splice;

an inwardly extending rib at an upper part of each cantilever member, the inner surfaces of said ribs spaced apart a distance less than the thickness of the packaged splice;

an elongate slot in said bottom web and extending between said cantilever members, said slot extending for a distance substantially equal to the length of the packaged splice;

said ribs on said cantilever members spaced from the base of said slot a distance at least equal to the height of the packaged splice; and

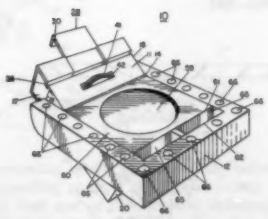
the arrangement being such that a packaged splice can be pushed down between said cantilever members, the packaged splice positioned in said slot and restrained from longitudinal movement, the packaged splice positioned freely between the cantilever members, the ribs engaging over the packaged splice and the cantilever members being substantially free of stress.

4,489,831

ADJUSTABLE STORAGE TRAY ASSEMBLY

Henry C. Lahneman, III, 233 Lawn Ave., Sellersville, Pa. 18944

Filed Mar. 15, 1984, Ser. No. 589,891
Int. Cl.³ B65D *85/28, 25/24;* A47B *5/00;* A47G *29/00*
U.S. Cl. 206—371 **5 Claims**



1. An adjustable storage tray assembly for use with inclined surfaces which comprises

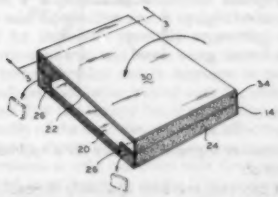
a base,

a tray hingedly secured to said base,

link means connecting said tray and said base, and

means carried by said base engaged with said link means for varying the relative angular position of said base and said tray.

4,489,832
TAMPER-EVIDENT CONTAINER
Charles R. Helms, Malvern, Pa., assignor to Container Corporation of America, Chicago, Ill.
Filed Jul. 8, 1983, Ser. No. 511,858
Int. Cl.³ B65D *85/672*
U.S. Cl. 206—387 **5 Claims**



1. A composite, tamper evident container for the packaging of audio or video cassettes or the like, comprising:

(a) a pair of generally similar body and cover members each including:

(i) a relatively thin paperboard main panel;

(ii) a molded plastic frame bonded to said main panel in an insert injection molding process and including a pair of end panels extending from opposite ends of said main panel and normal thereto and a pair of elongated, plastic, corner strips secured to said main panel at the front and rear edges thereof between said end panels;

(b) a relatively thin paperboard common rear wall panel extending between and secured to adjacent rear corner strips of respective members;

(c) said cover member being initially hingedly attached to said body member by said common rear panel and being adapted to be folded over on top of said body member to cover the latter after an article to be packaged has been inserted therebetween;

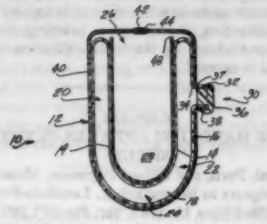
(d) said container having at an otherwise open front side thereof a detachable tab which must be broken away to afford access to the interior of said container through said otherwise open side;

(e) said cover and body members having their end panels bonded to each other and their front corner strips bonded to said detachable tab to form a closed container.

4,489,833
GUN CASE
James E. Bauer, 216 Birch Hill, Rochester, Mich. 48063
Filed Jul. 21, 1982, Ser. No. 400,297
Int. Cl.³ B65D *81/02, 85/30, 85/00*
U.S. Cl. 206—522 **7 Claims**

1. A gun case comprising:

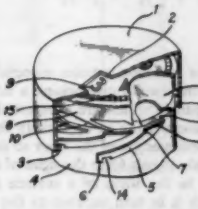
a flexible body having opposed sides, an integral bottom, an open top and closed end, the body including a sealed, inflatable interior space extending along substantially the entire length of the opposed sides and bottom;



means, communicating with the interior space in the body, for inflating the body; and

means for releasably closing the open top of the body.

4,489,834
COUNTING CAP FOR MEDICINE BOTTLES
James D. Thackrey, 13852 Dall La., Santa Ana, Calif. 92705
Filed Jul. 2, 1984, Ser. No. 627,219
Int. Cl.³ B65D *83/04, 85/42*
U.S. Cl. 206—534 **4 Claims**



1. A container for medicinal tablets, the cap of which contains a window through which a serial indicator is visible, the serial indicator advancing each time the container is opened and closed, the open end of the container and the cap being generally cylindrical and being attached to each other by multiple-start threads on the container which are engaged by lugs on the cap, and having a disc-spring member inside the cap, held down by the cap and sealing to the rim of the container opening, wherein the improvement comprises:

first and second abutment surfaces on the threads, said first abutment surfaces limiting rotation of the cap in the engaging direction by abutting the lugs on the cap, and said second abutment surfaces similarly limiting rotation of the cap in the disengaging direction, the rotation motion allowed to the cap being greater than the spacing between thread starts, and

an indicator element on which a number of serial indications are marked, the number being the number of thread starts, said indicator element being located within the cap, extending under the window and having a skirt which passes outside the disc-spring member and inside the cap, and

a number of finger-springs fixed to the skirt of said indicator element, said finger springs extending from the skirt both toward the container and circumferentially in the direction of disengagement, having on the end a shape which will engage said second abutment means, and being of a circumferential length, angle of placement, and flexibility that said finger-springs may be carried by friction between the cap and said indicator element along with the cap when the cap is rotated in an engaging direction,

whereby the cap and indicator element will move together

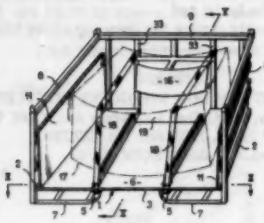
when the cap is rotated to engage the container, and said finger-springs will abut said second abutment surface overcoming friction and causing rotation between the cap and indicator element when the cap is rotated in the disengaging direction, this rotation indexing said indicator element and advancing the serial indication each time the container is opened.

4,489,835

DEVICE FOR HANDLING ARTICLES IN THE FORM OF SHEETS

Gérard Tombal, Paris, and Gilbert Pagnucco, Maurepas, both of France, assignors to Boussois S.A., Levallois-Perret, France

Filed May 11, 1982, Ser. No. 377,260
Claims priority, application France, May 29, 1981, 81 10684
Int. Cl.³ A47F 7/00
U.S. Cl. 211—41 8 Claims



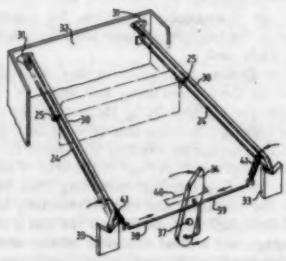
1. A device for handling articles especially in the form of sheets such as windshields, comprising a floor of trapezoidal shape, two side-panels which are substantially vertical in service, said side-panels being in oppositely facing relation and fixed on two opposite edges of the floor so that the floor edges adjacent to the side-panels form the sides of a trapezium, and a bearing member in the form of a surface secured to a rear framework which is in turn secured to the small base of the floor and to the side panels, the floor being provided beneath the bearing member with a recess which extends over a length at least equal to the length of said bearing member.

4,489,836

SUSPENSION FILING MEANS

Christopher E. Terrell, London, England, assignor to MC2 Ltd., London, England

Filed Jan. 12, 1982, Ser. No. 338,869
Claims priority, application United Kingdom, Jan. 13, 1981, 8100937; Jun. 24, 1981, 8119512
Int. Cl.³ A47F 5/00
U.S. Cl. 211—45 12 Claims



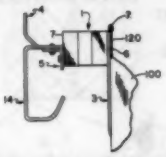
1. A suspension clip comprising a hook member in the form of a molded body of U-shape having a transverse part and two arms extending from said part, which transverse part and arms define a space having a side for passage of a supporting rail, one of which arms has on its outside a longitudinally extending narrow groove, a resiliently deflectable narrow prong of spring wire disposed clear of said side of said space and extending along said groove, and means anchoring said prong at or adjacent said transverse part.

4,489,837

MECHANIC'S CREEPER SUPPORT AND UTILITY TRAY

G. Brison Adair, 9401 Fairleigh Ct., Burke, Va. 22015

Filed Jun. 14, 1982, Ser. No. 387,794
Int. Cl.³ A47F 5/00
U.S. Cl. 211—86 3 Claims



1. An accessory support assembly for a tool cabinet, which is comprised of:

a support tray base and four upwardly depending side members forming an open-topped rectangular container structure, with one of the longer side members being attached to one end of said tool cabinet;

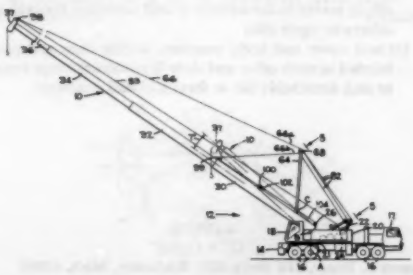
a pair of support straps depending downwardly from said longer side member attached to said tool cabinet, one adjacent each of the shorter side members depending upwardly from said support tray base, for engaging the side of said tool cabinet for stability; and a pair of support arms attached to the outer longer side of said support tray base opposite the side attached to said tool cabinet, extending outwardly therefrom, said arms being notched at their upper ends for receiving the caster axles of a mechanic's creeper.

4,489,838

LOW DROOP MULTI-PART PENDANT SUPPORTED BOOM

Harley R. Cozad, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

Filed Aug. 17, 1981, Ser. No. 293,727
Int. Cl.³ B66C 23/04, 7/00, 23/56
U.S. Cl. 212—264 1 Claim



1. In a crane or the like having an extensible boom formed from at least three telescoping boom sections each having a forward and an inner end and including a base section pivoted about a horizontal axis, power means including a single hydraulic ram operatively connected to different boom sections

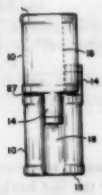
for selectively extending and retracting the boom, a live mast pivoted to the boom forwardly of said axis, pendant supporting sheaves journaled on the upper end of said mast, a pair of fixed length pendants trained around said sheaves, each pendant having first and second boom supporting parts extending forwardly of said mast sheaves with said first boom supporting parts being supportively connected to the forward end of said base section and said second pendant parts being supportively connected to the forward end of another of said boom sections, each pendant having an internal portion disposed within said boom with one end anchored to the forward end of said base section, sheaves journaled on the outer end of said ram and on the inner ends of two of said at least three boom sections with said internal portion of said pendants trained thereover, each fixed length pendant having an anchor mechanism rigidly secured thereto externally of said boom, abutment means secured to said base section which engage an anchor mechanism on said pendants when said pendants are supporting said boom in an upright position, and first power means for moving said mast between a substantially horizontal transport position supported on said base section and an upright boom supporting position and for thereafter pivotally supporting said boom about said horizontal axis, said boom being caused to droop in response to being extended and in response to said internal portion of each pendant being trained over the sheaves within said boom, said first and second boom supporting parts which extend forwardly of the mast sheaves being effective to reduce said boom droop about 50% in comparison to a boom supported by pendants at only one point near the forward end of said boom, and second power means being powered by hydraulic fluid and being connected to said pair of pendants for moving said anchor mechanism away from said abutment mechanism for maintaining said pair of pendants taut when said first power means is lowering said live mast into said transport position, said second power means being less powerful than said first power means and being overpowered by said first power means when said first power means is activated to raise said live mast from said transport position to said boom supporting position.

4,489,839

TWO-WAY NESTING CONTAINER FOR LIQUIDS

Charles N. Epperson, Okmulgee, Okla., assignor to Invention Development Equity Associates, Inc., Okmulgee, Okla.

Filed Aug. 10, 1979, Ser. No. 65,540
Int. Cl.³ B65D *21/02*
U.S. Cl. 215—10 **1 Claim**



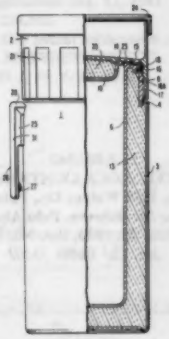
1. A container for holding liquids therein comprising a substantially vertical wall means closed at the top by a substantially flat top and closed at the bottom by a substantially flat bottom thereby defining a hollow container, a vertically directed hollow pouring spout extending upwardly from the top of said container adjacent said wall means and in communication with the interior of said container, means for closing the end of said spout, a first recess extending vertically upward from the bottom of said container along said wall portion and formed as an indent in said wall portion for receiving therein the spout of an underlying and upright container as defined above, and a second recess extending vertically downward from the top of said container along said wall portion and formed as an indent in said wall portion for receiving therein the spout of a super-imposed and inverted container as defined above while the spout of the given container is simultaneously received in the second recess in said super-imposed and inverted container, the flat top of each container being provided with at least one projection spaced from the spout, the flat bottom of each container being provided with at least one third recess spaced from the first recess whereby, when a container is super-imposed in upright position on a given container, each projection at the top of said given container will be received in a third recess in the bottom of the super-imposed container.

4,489,840

ISOTHERMAL CONTAINER WITH A CUP-SHAPED TOP

Elias M. De Freitas, Porto Alegre, Brazil, assignor to Termolar S/A, Porto Alegre, Brazil

Filed Aug. 3, 1983, Ser. No. 519,801
Claims priority, application Brazil, Aug. 10, 1982, 6201078
Int. Cl.³ B65D *47/06*
U.S. Cl. 215—13 R **5 Claims**



1. An isothermal container with a cup-shaped top comprising an outer body (3) and an inner container (6) fitted into said outer body (3), said inner container having an upper surface part, said outer body being closed at its bottom and having an upper edge (4) turned inwardly and fitting into an annular groove (5) formed in the inner container; there being thermal insulation between the inner container and the outer body, the inner container having an annular ridge (23) on its upper surface part surrounded by a tapered top surface (7) being a slight outward and downward slant thereby forming a projecting leading circumferential edge thereof extending into a downwardly and inwardly tapered surface, and forming a horizontal annular surface projecting outwardly, forming a recess (10), wherefrom a casing (8) depends which is fitted with an external thread (9) the cup-shaped top being threaded onto the external thread (9) a sealing ring (11) resting on said tapered top surface (7) and fitted into the recess (10), and extending above the ridge (23) and further having an annular projection (12) at its top surface.

4,489,841

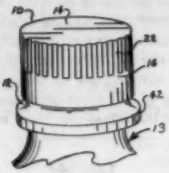
TAMPER EVIDENT CLOSURES AND PACKAGES

Mortimer S. Thompson, Arlington, Mass., assignor to Tri-Tech Systems International, Inc., West Springfield, Mass.

Filed Feb. 18, 1983, Ser. No. 467,791
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—203 **53 Claims**

1. A tamper evident cap for a container having an opening for dispensing its contents and engaging means about the opening, comprising a resealable substantially rigid cap for closing, opening and reclosing the container having a portion of plastic with a recess therein which forms a thin section about which is

a thicker section, wherein said thin section stretches preferentially upon the application of tensile stress thereto to effect a color change in the cap, and mechanical means thereon



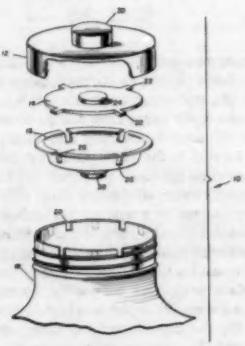
adapted to engage the engaging means to the container and coact therewith to preferentially stretch said thin section to effect a change in color for indicating the condition of the container.

4,489,842

MAGNETIC LOCK CONTAINER CAP

Arthur M. Bobrove, 1539 Walnut Dr., Palo Alto, Calif. 94303, assignor to Arthur M. Bobrove, Palo Alto, Calif.

Filed Aug. 22, 1983, Ser. No. 525,547
Int. Cl.[3] B65D 55/02
U.S. Cl. 215—213 22 Claims



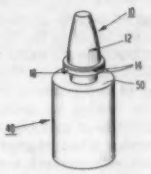
1. An unlimited orientation locking cap and container system comprising a container having an opening defined by an upstanding wall portion, an outer cup shaped cap member arranged to close said opening, an inner housing secured within said cap member and including means defining at least one vertically extending slot, locking means positioned within said housing and including at least one locking member projecting outwardly from said at least one slot, said locking means being vertically movable within said housing between a raised unlocked position and a lowered locking position, said upstanding wall portion including means for engageably receiving said at least one locking member when said cap is on said container and said locking member is in its lowered position, means for releasably holding said locking means in its lowered position and means for releasing said releasably holding means.

4,489,843

TAMPER-EVIDENT CLOSURE AND CONTAINER

Edward J. Drozd, Jr., Lake Hiawatha, N.J., assignor to Captive Plastics, Inc., Piscataway, N.J.

Filed Mar. 17, 1983, Ser. No. 476,147
Int. Cl.[3] B65D 41/34
U.S. Cl. 215—252 20 Claims



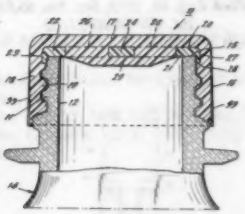
1. A tamper-evident closure including:
(a) a threaded cap;
(b) a tamper-evident ring;
(c) break-away tab means removably attaching the ring to the cap and adapted to break when the closure is rotated in a direction to remove the cap from a cooperating container; and
(d) cooperating surface means on said cap and ring, independent of the break-away tab means, for transmitting closing rotational movement from the cap to the ring to thereby cause said cap and ring to rotate together in the closing direction of rotation of said closure, and thereby prevent separation of the ring from the cap at the break-away tabs when the closure initially is secured to the container.

4,489,844

CREW-TYPE ALL PLASTIC CLOSURE

Charles A. Breskin, White Plains, N.Y., assignor to Charles A. Breskin Assoc. Inc., Scarsdale, N.Y.

Filed Dec. 14, 1982, Ser. No. 449,798
Int. Cl.[3] B65D 41/04; B28B 1/24
U.S. Cl. 215—329 6 Claims



1. A removable and reusable screw-type cap for a carbonated beverage container or the like having an opening defined by an externally threaded annular neck; said cap comprising a unitary structure including a shell and a fitment; said shell including a disk-like cover portion and an internally threaded skirt portion depending from said cover portion at the periphery thereof; said fitment being disposed within the shell at the end thereof having said cover portion; said fitment having an exposed annular surface portion operatively positioned to engage a container's annular neck at its free end; said fitment and said shell being injection molded of first and second materials, respectively, said materials comprising different plastics or different colors; said fitment includes a ring and a hub surrounded by said ring and a plurality of spokes radiating from said hub and connected to said ring; said exposed annular surface being part of said ring.

4,489,845

SCREW-CAP FOR CONTAINER

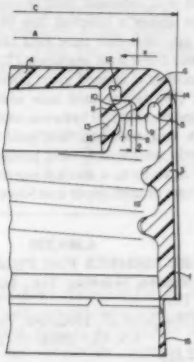
Dietmar Aichinger, Rünenberg, and Hans-Werner Breuer, Himmelried, both of Switzerland, assignors to Albert Obrist AG, Reinach, Switzerland

Filed May 3, 1983, Ser. No. 491,209

Claims priority, application Switzerland, May 4, 1982, 2720/82

Int. Cl.³ B65D *53/00*

U.S. Cl. 215—329 8 Claims



1. A screw-cap made of plastic material for closing the mouth of a container having a predetermined outer diameter, consisting of an approximately cylindrical cap side-wall with inner threading and a cap top, which is provided with a ring-shaped sealing lip to seal against the outer side of the mouth of the container in the area of the opening, characterized in that the inner diameter (A) of the sealing lip (5), before the screw-cap (1) is screwed on, is greater than the outer diameter (B) of the container mouth (2) against which it is to seal, in that the cap top (4) has a clamping device inserted into the container mouth for effecting radial contraction of the cap top when putting on the screw-cap, and in that at least the cap top is elastically constructed in such a way that the sealing lip is contracted inwardly and pressed against the outer side of the container mouth, as the clamping device is inserted into the container mouth, by means of the compression of the cap top and the radial contraction and reduction of its outer diameter.

4,489,846

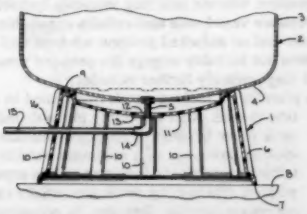
SELF-LEVELING BASE FOR TANK

Herbert W. Nickel, Germantown, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Oct. 6, 1983, Ser. No. 539,682

Int. Cl.³ B65D *25/20, 90/12*

U.S. Cl. 220—69 9 Claims



1. In combination, a tank having a dome-shaped lower head, a member extending axially outward from said head, a base secured to said head and disposed to support the tank from a supporting surface, said base comprising a generally annular skirt having an upper rim disposed in contact with said head and having a lower edge resting on said supporting surface, a wall extending across said skirt and spaced beneath said head and having an opening to receive said member, the area of said opening being substantially greater than the area of said member whereby said base can be shifted laterally relative to said member, and connecting means connected to the lower end of said member and disposed in contact with the lower surface of said wall to cause said rim to be brought into firm engagement with said head, lateral shifting of said base relative to said head enabling said base to conform to uneven supporting surfaces.

4,489,847

PARROT-BEAKABLE FREESTANDING PLASTIC DRUM ASSEMBLAGE

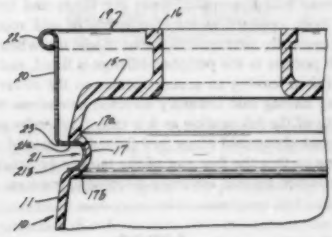
Geoffrey C. Ames, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 876,081, Feb. 8, 1978, Pat. No. 4,294,374, which is a continuation of Ser. No. 636,272, Nov. 28, 1975, abandoned. This application Jan. 12, 1981, Ser. No. 224,582

The portion of the term of this patent subsequent to May 20, 1997, has been disclaimed.

Int. Cl.³ B65D *1/46, 6/34, 25/22*

U.S. Cl. 220—71 8 Claims



1. A plastic drum assembly for the storage, handling and shipment of materials, said assembly comprising, in combination, a single piece molded plastic drum having a top end panel, a bottom end panel and a circumferential sidewall merging with said top and said bottom end panels, said top end panel defining an opening, said circumferential sidewall including a circumferential indentation adjacent said top end panel, and a circumferentially disposed collar member assembled to said drum,

said collar member comprising

a generally circumferentially disposed collar sidewall; said collar being at no point higher than said top end panel and terminating at its highest portion in a bead-like portion which merges with said collar sidewall at the top thereof and projects radially outwardly from said sidewall of said collar, and which is spaced apart from, and does at no point in its circumference touch, said drum and is thus adapted for gripping about substantially the full 360° of the collar circumference, by the opposed jaws of a steel drum chime-handling device having two opposed movable jaws to holdingly grip the collar with one jaw engaging the inside surface wall of the bead and the other jaw engaging the outer underside surface of the bead; and

a radially inwardly disposed circumferential projection near its lower edge,

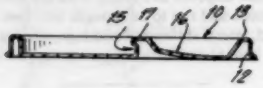
said circumferential projection and said circumferential indentation being inter-engaged to retain said collar on said plastic drum while the drum is manipulated by such handling device which holdingly grips said collar.

4,489,848

BEVERAGE CONTAINER COVER

Elton Braude, 41-29 50th St., Woodside, N.Y. 11377

Filed Apr. 28, 1982, Ser. No. 372,647
Int. Cl.³ B65D *41/46*
U.S. Cl. 220—90.4 **2 Claims**



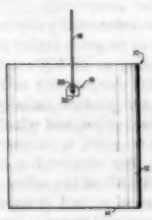
1. A unitary cover for a container having an opening at its top and a rim surrounding said opening comprising a substantially planar disc-shaped member, a substantially flat top portion on said cover to overlie the container opening, a peripheral flange integral with and depending from the top portion to embrace the container rim, a captive tab portion in said top integral with said top, spaced top weakening score lines in the top portion extending partially across the top portion and ending at the outer edge of the peripheral flange to define the sides of the tab, said score lines being spaced from each other in substantially parallel orientation and terminating substantially at the center of the top, a hinge normally disposed between said spaced score line ends near the center of the top, a transverse fold line spaced from the hinge and between the score lines, opposed indented portions in said score lines to define inwardly directed extensions of said top when the end of the tab portion in the peripheral flange is lifted, and when the tab is raised leaving an access opening in the cover with said opening having said inwardly directed extensions disposed in the path of the tab portion as it is raised, whereby the tab can be moved about said hinge and folded along said transverse fold line so that the free end of the tab can be retained in the open position by said inwardly directed extensions.

4,489,849

PIVOT ASSEMBLY

Henry J. Blanchette, Leominster, Mass., assignor to Plastican, Inc., Leominster, Mass.

Continuation of Ser. No. 350,145, Feb. 19, 1982, abandoned.
This application Apr. 3, 1984, Ser. No. 596,245
Int. Cl.³ B65D *25/32*
U.S. Cl. 220—91 **6 Claims**



1. In combination with a plastic container (10) having a sidewall (12) and a bottom wall (14), said sidewall terminating in an upper end and a lower end and said bottom wall closing off said lower end, a hollow pivotal support means (16) for attaching a bail (18) to said container, said support means (16) comprising:

a continuous wall integral with said sidewall, and continuous wall having first, second, and third wall segments;

said first wall segment (20) projecting outward from a portion of said sidewall (12);

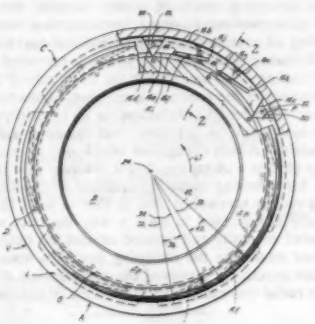
said second and third wall segments (22 and 24 respectively) being of predetermined thicknesses and supported by said first wall segment (20) in spaced relationship to said sidewall, with said second wall segment (22) being disposed further from said sidewall than said third wall segment (24) by a distance equal to said predetermined thickness of said third wall segment, said second wall segment having a portion nearer a selected one of said upper and lower ends of said sidewall than said third wall segment, said second and third wall segments (22 and 24) being abutted to one another at spaced apart points so as to define a first aperture (30) facing said side wall and dimensioned to accommodate said bail between said second and third wall segments, and with said first wall segment being abutted to said side wall and to said portion of said second wall segment as to form a second aperture facing toward said selected one of said upper and lower ends of said sidewall.

4,489,850

CLOSURE MEMBER FOR PRESSURE VESSEL

Raymond P. Reneau, Houston, Tex., assignor to Reneau, Inc., Sugarland, Tex.

Filed May 27, 1983, Ser. No. 498,838
Int. Cl.³ B65D *45/28*
U.S. Cl. 220—323 **15 Claims**



1. A closure member for a pressure vessel, comprising:

a ring assembly having an outside diameter and an inside diameter, said outside diameter being radially expansible and said inside diameter, defining a central area, said central area of a diameter greater than one-half said outside diameter;

said ring assembly selectively movable between a locked position wherein said ring assembly lockably engages the pressure vessel with said radially expansible outside diameter and an unlocked position wherein said ring assembly does not lockably engage the pressure vessel;

said ring assembly further includes:

a plurality of locking pawls maintained in a spaced relation to each other uniformly movable independently of each other between a retracted position wherein said locking pawls are of a minimum outside diameter permitting said unlocked position and an expanded position wherein said locking pawls are radially expanded into a maximum outside diameter in engagement with the pressure vessel to secure said ring assembly with the pressure vessel in said locked position;

each of said locking pawls having an inner annular surface, an outer annular surface, a first end, and a second end; and

each of said locking pawls having at least two elongate slots formed extending from an inner point proximate to said inner annular surface to an outer point proximate to said outer annualr surface, said first elongate slot adjacent said first end of said locking pawl at a different angle with respect to a tangent to a radial intersecting the central axis of said ring assembly than said second said elongate slot on said locking pawl.

4,489,851

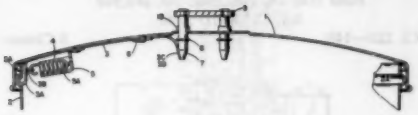
CONTAINER COVER LOCK

Norman Russ, Box 508, Norwich, Conn. 06360

Filed Jun. 13, 1983, Ser. No. 503,669

Int. Cl.³ B65D *45/28*

U.S. Cl. 220—323 **1 Claim**



1. A can and cover assembly comprising a can structure with cylindrical side walls, said can structure side walls having an annular upper rim portion defining an inwardly facing annular groove spaced below said rim portion, a cover structure having an annular skirt adapted to fit outside said annular rim portion and said groove defining portion of said can structure, a manually movable handle mounted centrally of said cover and adapted for limited longitudinal movement in the axial direction between locked and unlocked positions, at least three bars mounted to the underside of said cover for limited radial movement between locked and unlocked positions, outer ends of said bars receivable in said annular groove in the locked positions therefor, springs biasing said bars toward their unlocked positions such that said outer ends are not in said annular groove, inner ends of said bars defining ramp surfaces, and posts engageable with said handle, said posts having inner ends engageable with said ramp surfaces on the inner ends of said bars to cause movement of the bars radially outwardly as the handle is pushed axially inwardly so that said bar outer ends are received in said annular groove to lock the cover in place in response to such inward axial movement of said handle.

4,489,852

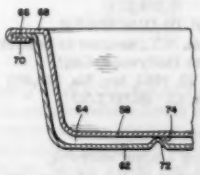
INSULATED COOKING UTENSIL

Eugene T. Logan, 2404 Parkwood Cir., Claremore, Okla. 74017, and Richard A. Barlow, 949 Marymount Rd., Salina, Kans. 67401

Filed Sep. 28, 1982, Ser. No. 425,435

Int. Cl.³ B65D *25/18*

U.S. Cl. 220—469 **2 Claims**



1. Insulated cooking utensil means comprising first and second cooking surfaces disposed in mutually spaced relationship, an air chamber interposed between the first and second cooking surfaces for insulating one of said surfaces from direct heat during a cooking operation, and means interposed between the first and second cooking surfaces for supporting thereof in said spaced relationship and to maintain said spaced relationship, said last mentioned means comprising a plurality of spaced detents provided in one of the cooking surfaces for engagement with the other of the cooking surfaces whereby the air is maintained in the air chamber at all times during the cooking operation and including peripheral means cooperating between the first and second cooking surfaces for securing said cooking surfaces together in said spaced relationship, the peripheral means including an outwardly extending planar flange member provided around the outer periphery of one of the cooking surfaces, and reverse-bend flange means provided around the outer periphery of the other of the cooking surfaces for permanent, intimate securing engagement with the planar flange member, wherein the first and second cooking surfaces comprise substantially rectangular planar surfaces disposed in substantially mutually parallel relationship.

4,489,853

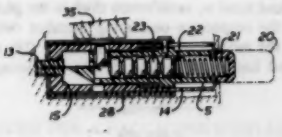
PILL DISPENSING DEVICE

Jay S. Korte, 1105 Canterbury Dr., and John E. Thees, 4599 Mud Pike, both of Celina, Ohio 45822

Filed Dec. 15, 1982, Ser. No. 432,668

Int. Cl.³ B65H *3/24*

U.S. Cl. 221—187 **3 Claims**



1. Means for dispensing pills comprising a cartridge unit having a container for storing a quantity of pills, and means for presenting a single pill at one time for use including an ejector element which is resiliently operatively positioned by longitudinal predetermined movement of the container and causes the pill to be propelled therefrom after such movement, the aforesaid container being an elongated member in which the pills are positioned in alignment for movement toward a first end, there being a delivery opening in the container near said end, an ejector element tensioning ramp is located at said first end, the container is positioned for movement in a housing, a housing is provided for same, the ejector element is operatively located in the housing to cooperate with the ramp aforesaid, said housing having an opening therein through which a pill is delivered when the openings in the container and housing are aligned by the movement referred to and the ejector element is suddenly disengaged from the ramp after the predetermined movement aforesaid.

4,489,854

DISPENSING UNIT FOR ELONGATED ARTICLES

Gregory Wenkman, Middleton, and Ferdinand Salzmann, Prairie du Sac, both of Wis., assignors to Traex Corporation, Dane, Wis.

Filed Jul. 26, 1982, Ser. No. 401,553

Int. Cl.³ B65H *3/62*

U.S. Cl. 221—202 **6 Claims**

1. A dispensing unit for elongated articles comprising

a rectangular storage bin (12) having a dispensing port (20) in the front thereof;

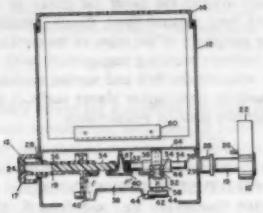
a support shelf (64) located in the storage bin (12) sloped so that articles placed thereon will roll toward the dispensing port (20);

at least one handle (16) on the exterior of the storage bin (12) operable by hand;

a pivotable lever operator (32) rotated by operation of the handle (16);

at least one oscillating member (46) including a pickup finger

(18), the oscillating member (46) moving forwardly and backwardly as the lever operator (32) is rotated so that the pickup finger (18) moves into and out of the storage bin (12), the oscillating member (46) including a slot (48) formed in it through which the lever operator (32) extends so that the oscillating member (46) is entrained on the lever operator (32) to limit the movement of the oscillating member (46); and



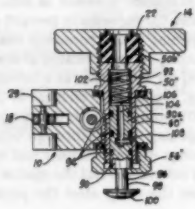
a pickup finger guide (18) mounted on the front of the storage bin (12) just under the dispensing port (20) for each oscillating member (46), the pickup finger guide (18) being shaped and sized so as to retain therein the pickup finger (52) of the respective oscillating member (46) so as to confine the motion of the pickup finger (18) to the forward and backward motion of the oscillating member (46).

4,489,855

INSTANT TIRE INFLATOR

Ronald L. Boetger, Willoughby, Ohio, assignor to Code Manufacturing, Inc., Willoughby, Ohio

Filed Aug. 27, 1982, Ser. No. 412,148
Int. Cl.³ B60C *23/10*
U.S. Cl. 222—5 **6 Claims**



1. An inflator comprising:

(a) a housing including means to receive a cartridge of compressed gas, means to pierce said cartridge, and a passage for gas flow;

(b) means forming a part of said passage and having a restrictive orifice to control the flow through the passage; and

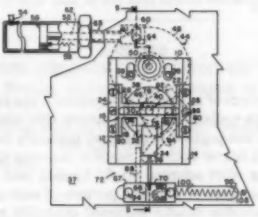
(c) a tubular support non-rotatably received within said housing and threaded at at least one end thereof, a chuck body rotatably carried on the threads of the tubular support stem, said body having an opening for receiving a valve stem and communicating with the interior of the tubular support, a peripheral surface on said body constructed to facilitate rotating the body on the threads of the tubular support, a cavity between the opening and the tubular support, and an annular elastomeric gasket positioned in the cavity to surround the stem received in the chuck body, said body having means thereon to compress the gasket axially between the body and the tubular support through rotation of the body relative to the housing to expand the gasket radially and form a seal around the stem.

4,489,856

METHOD AND APPARATUS FOR MOVING A NOZZLE BETWEEN A STORAGE POSITION AND A POSITION FOR APPLYING A FLUID

Richard C. Baughman, Geneseo, and David S. Bump, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 24, 1982, Ser. No. 380,965
Int. Cl.³ B67D *5/46*
U.S. Cl. 222—148 **6 Claims**



1. Apparatus for applying a fluid, the apparatus comprising:

a nozzle;

means mounting said nozzle for movement between (1) a storage position and (2) an operating position for applying fluid;

a sump;

means coupled to the sump and the nozzle for locating the sump (1) in a first position for receiving an end of the nozzle when the nozzle is in its storage position and (2) for locating the sump in a second position spaced from the nozzle when the nozzle is in its operating position, and

means coupled to said nozzle mounting means and to said locating means for automatically returning the sump to its first position and the nozzle to its storage position during periods when the nozzle is not applying fluid.

4,489,857

LIQUID DISPENSER

George X. Batlas, Astoria, N.Y., assignor to Bobrick Washroom Equipment, Inc., North Hollywood, Calif.

Filed Mar. 22, 1982, Ser. No. 360,403
Int. Cl.³ B67D *5/42*
U.S. Cl. 222—179 **15 Claims**

1. A liquid dispenser comprising:

(a) a housing providing a liquid reservoir;

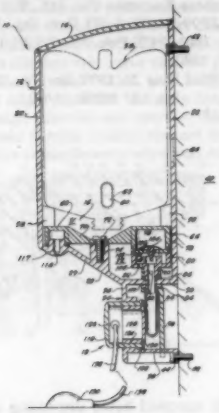
(b) a dispensing chamber in the housing, the dispensing chamber having an inlet for receiving liquid from the reservoir and a dispensing outlet for dispensing liquid from the dispensing chamber;

(c) a resilient, flexible pump in communication with the dispensing chamber;

(d) a piston for pressing against the pump;

(e) a button for pressing against the piston, wherein the

button and piston cooperate to form an enclosed push chamber; and



(f) a fluid inlet into the push chamber for pressuring the push chamber to cause the piston to press against the pump without pushing the button.

4,489,858

DISPENSING VALVE TO BE USED WITH BOTTLES OF FLUENT IMAGING MATERIAL FOR THE DEVELOPMENT OF ELECTROSTATIC IMAGES

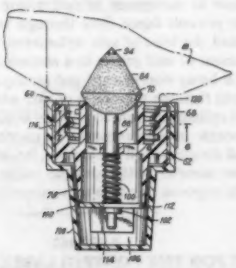
Frederick J. Pritchitt, Kingston, N.Y., assignor to Marpac Industries, Inc., Kingston, N.Y.

Division of Ser. No. 303,379, Sep. 18, 1981, Pat. No. 4,372,467, which is a continuation-in-part of Ser. No. 157,510, Jun. 9, 1980, abandoned. This application Jun. 7, 1982, Ser. No. 385,525

Claims priority, application Canada, Feb. 11, 1981, 370582; United Kingdom, Feb. 23, 1981, 8105651; Ireland, Feb. 24, 1981, 375/81; Fed. Rep. of Germany, Jun. 4, 1981, 3122293

Int. Cl.³ B65L *47/12*

U.S. Cl. 222—182 **3 Claims**



1. A dispensing valve to be used on a supply bottle containing a fluent imaging material adapted to be employed in an electrostatographic copying machine, said bottle including a male half of a coupling means, said valve comprising:

(A) a valve cap having a skirt that is provided internally with a female half of a coupling means adapted to rotatably mesh with the male half of the coupling means on the bottle neck,

(B) the valve cap having a central opening for passage of fluid from the bottle therethrough,

(C) a spindle extending through said opening in the cap,

(D) a valve seat carried by the cap,

(E) a resilient centrally bored valve plug threaded on the spindle,

(F) spring means to bias the valve plug against the seat,

(G) said spindle having an end that protrudes through the discharge end of the central opening in the cap,

(H) an enlargement on the spindle, said enlargement being disposed outside of the cap,

(J) a retaining clip in the form of a disc having a diametrical slot with an open end at the periphery of the clip and a closed end within the clip, said clip being disposed between said spring and said enlargement, said disc being seated on the discharge end of said cap whereby the spindle is locked in place against opening movement to prevent inadvertent lifting of the valve plug off its seat, and

(K) an overcap covering the valve cap and out of contact with the spindle so as to protect the spindle against accidental axial displacement in an opening direction so long as the overcap is in place, said overcap and said valve cap having surfaces that couple when the overcap is in place on the valve cap in order to enable rotation of the overcap to cause consequent rotation of the valve cap, said valve cap and said overcap including cooperating means to detachably inter-engage each to the other so as to enable the overcap to be pulled off the valve cap easily to expose the clip which thereupon can be removed to render the dispensing valve fully operable.

4,489,859

CLOSURE FOR A PACKAGING CONTAINER

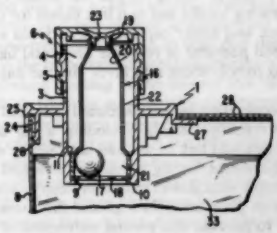
Dieter vom Hofe, Cologne, and Peter Vierkötter, Leverkusen, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Oct. 29, 1982, Ser. No. 437,875

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145357

Int. Cl.³ B65D *47/06*

U.S. Cl. 222—183 **10 Claims**



1. A closure for a packaging container for liquid or free-flowing product with a mechanically reinforced case, said closure permitting the continuous or intermittent dispensing of the said liquid or free-flowing product contents of said packaging container, wherein a continuous pipe sleeve with a bottom opening is molded into the product dispensing opening of a top adapted to fit and reinforce the case and fixedly attach to a liner at the top's longitudinal end, which faces into the interior of the container, said continuous pipe sleeve being provided with a tubular ball bearing housing within which a valve ball is free to move, which includes a sealing cone which acts as a ball valve seat at the longitudinal sleeve outlet end and a flared annular ball chamber above the bottom opening, which forms the longitudinal sleeve inlet end, and a freely movable valve ball located within the continuous tubular ball bearing housing.

4,489,860

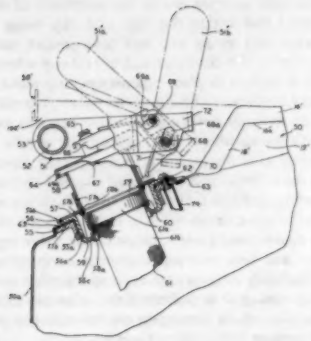
SAFETY CAN CONVERSION APPARATUS

Frank S. Flider, Mattoon, Ill., assignor to Justrite Manufacturing Company, Mattoon, Ill.

Continuation-in-part of Ser. No. 283,569, Jul. 15, 1981, abandoned. This application Jun. 16, 1982, Ser. No. 389,013

Int. Cl.³ B65D 47/08

U.S. Cl. 222—189 3 Claims



1. In combination with a safety container for storing volatile inflammable fluid having an opening, a top surface, and a bottom surface, with a pour spout having a first and a second end secured within said opening, and a flame arrestor assembly operably affixed to the pour spout at the second end and suspended within the opening in the container, said combination further including a spring biased safety cap pivotally joined by means of connecting link means to a pivot support means, such that the safety cap may pivot between at least a first position wherein the safety cap is engaged with the pour spout to substantially seal the opening in the container, and a second position wherein the safety cap is substantially disengaged from the pour spout, said link means pivotally connected to said pivot support means by a pivot pin, the combination further including an operating handle also pivotally attached to the pivot support means by said pivot pin, and means cooperating with said operating handle and said link means for causing said link means and said safety cap to pivot between at least said first and second positions in response to pivotal movement of said operating handle about said pivot pin, the improvement comprising:

said cooperating means associated with said link means and said operating handle including a pin member passing through said link means and said handle means;

said link means having a first and a second end, and being operably attached to said safety cap at said first end;

said pivot pin passing through said link means at said second end to provide said pivotal movement of said safety cap between said first and second positions in response to rotation of said operating handle;

said operating handle having a slot therein cooperating with said pin member through which said pin member passes;

said slot guiding movement of said pin member in response to pivotal movement of said safety cap and said link means responsive to excessive pressure applied to said safety cap by the contents of said container when said safety cap is in said first closed position, to allow said safety cap to disengage from said pour spout and permit venting of said container interior without movement of said operating handle;

said slot having a front and a back end; and

said pin member travelling along said slot towards said front end in response to pivotal movement of said link means when said link means is displaced for said venting.

4,489,861

MANUAL LIQUID DISPENSING DEVICE

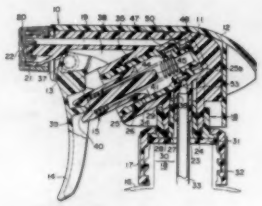
Tadao Saito, and Takaharu Tazaki, both of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

PCT No. PCT/JP79/00130, § 371 Date Jan. 21, 1981, § 102(e) Date Jan. 15, 1981, PCT Pub. No. WO80/02516, PCT Pub. Date Nov. 27, 1980

PCT Filed May 21, 1979, Ser. No. 230,944

Int. Cl.³ B05B 11/00

U.S. Cl. 222—207 7 Claims



1. A manually operated liquid dispensing device having a body, a cylindrical bore formed in said body and having an inlet and an outlet, a nozzle having a nozzle hole and coupled for communication with the outlet of said cylindrical bore, a piston slidably mounted within said cylindrical bore, and a trigger coupled to said portion for slidably moving said piston to produce a pumping action for spraying liquid from said nozzle hole, and further comprising:

a hollow adapter member having an inlet and an outlet and positioned within said cylindrical bore so that the inlet and outlet of said adapter member may communicate with said inlet and outlet, respectively, of said cylindrical bore; and

an elastic valve telescoped over one end of said adapter, said valve including a first portion forming a valve body, a second portion integrally coupled to and extending from said valve body, and a third portion integrally coupled to and extending from said valve body, said valve being positioned within said cylindrical bore and said second portion being constructed and arranged to allow the passage of a liquid from the inlet of the cylindrical bore through the inlet of the adapter to within said adapter in response to movement of said piston in a first direction and to prevent liquid flow through said adapter member inlet and the inlet of said cylindrical bore in response to movement of said piston in a second direction, said third portion being constructed and arranged to permit a flow of liquid through the outlet of said adapter and the outlet of said cylindrical bore to provide liquid to said nozzle and said nozzle hole in response to piston movement in said second direction and preventing liquid flow through said adapter member outlet and the outlet of said cylindrical bore in response to piston movement in said first direction.

4,489,862

DEVICE FOR THE CONTROLLABLE REMOVAL OF BULK MATERIALS FROM CONTAINERS

Winfried Diem, Ilvesheim, Fed. Rep. of Germany, assignor to Hubert Eirich; Paul Eirich and Walter Eirich, all of Hardheim, Fed. Rep. of Germany

Filed Jan. 22, 1982, Ser. No. 341,910

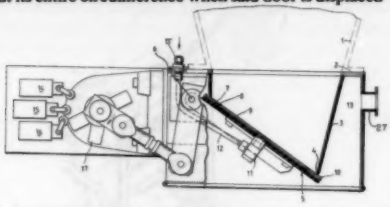
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1981, 3103274

Int. Cl.³ G01F 11/00

U.S. Cl. 222—263 6 Claims

1. For a container for bulk material having at the bottom an outlet surface defined by an annular outlet edge inclined to the horizontal, said edge being sharp about its entire circumference, a hinged door constituting a valve element cooperable with said outlet edge for the controllable discharge of bulk

materials from said container, said valve element having a gas-permeable lining facing the bulk material in said container and an annular sealing element surrounding said lining and registering with said annular outlet edge when said valve element is closed, said lining having a gas connection for at least partially fluidizing said bulk material in said outlet, and operator means to displace said valve element partially from a closed position closing said outlet, said hinged door being below said outlet edge, said door having a hinge axis remote from said outlet edge whereby said operator means is operable to first displace said annular sealing element from said outlet edge about its entire circumference when said door is displaced



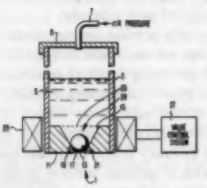
from its closed position, and upon displacement of said door into its closed position, said sharp edge cooperates with said sealing element to press the bulk material sideways out of position between said sharp edge and said sealing element, the hinge axis being offset from and higher than the central axis of the outlet so that the operator is operable to displace said element furthest away from the lowermost portion of said inclined outlet edge to afford partial discharge of said bulk material in the outlet between said lowermost edge portion and said valve element, said gas connection being constructed and arranged to afford fluidization of the bulk material by gas flowing through said lining of the valve element during displacement of said element.

4,489,863

PRECISION FLUID DISPENSE VALVE

Leonard A. Horchos, and Harold W. Lorber, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 11, 1982, Ser. No. 347,843
Int. Cl.³ F16K *31/08*
U.S. Cl. 222—504 **9 Claims**



1. A dispense valve arrangement for accurately metering fluid under pressure in quantities dependent upon the frequency and duration of electrical pulses, comprising:

a non-magnetic wall segment having an annular frustoconical orifice with a tapered wall that constricts in a direction away from said fluid;

a sphere of magnetizable material coated with non-magnetic material, positioned within said orifice for closing said orifice and preventing escape of said fluid under pressure;

a permanent magnet embedded within said non-magnetic wall segment at or near the surface of said tapered wall, positioned to seat said sphere against said tapered wall to close said orifice;

an AC coil, concentrically wound to surround said non-magnetic wall segment, responsive to electrical pulses to create a magnetic field within said frustoconical orifice without the use of magnetic pole pieces within said frustoconical orifice, said magnetic field overriding said permanent magnet and causing said sphere to unseat and open said orifice; and,

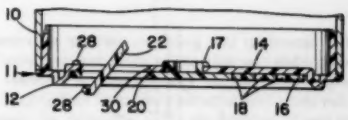
a screen of non-magnetic material for retaining said sphere within said orifice when said AC coil is energized by said electrical pulses to unseat said sphere.

4,489,864

INTERFERENCE STOP PUNCH-OUT CLOSURE

R. Melvin Davis, Reedsville, Pa., assignor to Weatherchem Corporation, Twinsburg, Ohio

Filed Apr. 27, 1983, Ser. No. 489,260
Int. Cl.³ B65D *47/10*
U.S. Cl. 222—541 **4 Claims**



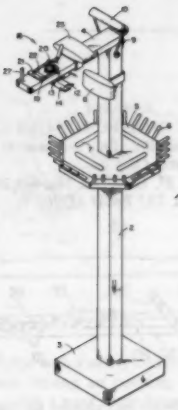
1. A reclosable punch-out end closure for the top end of a tubular container, said reclosable end closure comprising a one-piece plastic cap adapted to be secured to the top end of the container, said cap including a container end wall, said cap also including a punch-out tab defined by a reduced thickness tearing web formed in said end wall, groove means in said end wall extending from one or both surfaces of said end wall to said tearing web, hinged pin means molded integrally with said end wall and extending across said tearing web and groove means from said end wall proper to said punch-out tab, said tab having an arcuate edge at least at the side opposite said hinge pin means, rupture and tearing of said tearing web at the time of opening allowing said tab to hinge, on said hinge pin means, inwardly from said end wall to form an inner dispensing opening in the end wall, said end closure also including a rotor carried on said one-piece plastic cap, at least one dispensing opening formed in the rotor, said at least one opening being the major outer dispensing opening of the closure and having an arcuate edge which registers substantially congruently with said arcuate edge of said inner dispensing opening at the one rotative position of said rotor at which the fully open dispensing condition of said end closure is to be established, said hinge pin means being subject to failure during or following opening of the tab whereby if the hinge pin means breaks and the tab falls into the container then during dispensing the tab flows along with the contents of the container and tends to be dispensed therewith, said arcuate edge of said major outer dispensing opening having a given radius, the arcuate shape of said tearing web having a radius just exceeding said given radius to thereby establish potential interference fits of said tab with said major outer dispensing opening in all possible relative orientations between the two, whereby if said hinge pin means breaks, said tendency of the tab to be dispensed is positively overcome by an interference stop established by said interference fit, said arcuate shape of the major outer dispensing opening and of said substantially congruent edge of the tab allowing exertion of downward compressive finger pressure at a location sufficiently close to the tearing web to indirectly apply tensile pressure with sufficient concentration to rupture the web and thereby initiate tearing of the web and opening of the tab.

4,489,865

HOLDING MEANS APPARATUS

William A. Wriedt, 2133 Barberry La., Green Bay, Wis. 54304

Filed Dec. 15, 1983, Ser. No. 561,948
Int. Cl.³ D05B 87/00
U.S. Cl. 223—99 4 Claims



1. A device for the one handed threading of the eye of a needle and the knotting of the strand threaded through the eye of the needle and comprising;

(1) a holding and positioning structure having a base, a verticle standard projecting upward from the base and having a top end and a horizontal arm having one end joined to the top end of the standard at a right angle and the other end of the arm as a free end,

(2) a turntable rotatably mounted to the standard in the midspan of the standard between the base and the top end of the standard and the turntable has upward angled pegs around the perimeter of the turntable and the turntable has an upper flat surface in which shallow elongate grooves are formed for holding needles, small implements and the like,

(3) a mousetrap like spring loaded clamp secured to a top surface of the horizontal arm a short distance inward from the free end of the arm,

(4) a looping post projecting upward from the top surface of the arm and located near the free end of arm,

(5) a cinching plate secured to the top surface of the arm at a location between the looping post and the clamp and the cinching plate has at least one hole passing through the plate and continuing on through the horizontal arm,

(6) a needle threader turret rotatably secured to an underside of the horizontal arm at a location inward from the free end of the arm and the needle threader turret has secured thereto at least one needle threader which is positionable so as to be readily employable by person having the use of only one hand, and

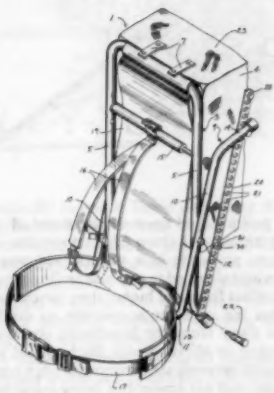
(7) the positional relationship between the turntable, the looping post, the clamp, the needle threader, and the cinching plate are such as to provide close and direct access for the carrying of a thread, a needle and the like from one to the other for the purpose of threading the needle, knotting the strand threaded in the needle and cinching the knot thus formed by a person using only one hand.

4,489,866

BACKPACK WITH IMPROVED COMFORT STRUCTURE

Gerald A. Korte, Brookfield, Wis., assignor to Diamond Brand Canvas Products Co., Inc., Naples, N.C.

Continuation-in-part of Ser. No. 273,258, Jun. 12, 1981, abandoned. This application Nov. 16, 1983, Ser. No. 552,109
Int. Cl.³ A45F 4/02
U.S. Cl. 224—155 6 Claims



1. A backpack frame for hikers and the like, comprising in combination:

(a) a primary frame having a pair of spaced generally parallel siderails joined at their upper and end portions by a cross-bar,

(b) said primary frame adapted to support a pack body secured to the rear side of said primary frame,

(c) a supplemental frame disposed adjacent said primary frame and having a pair of spaced generally parallel legs joined at their lower end portions of a cross-bar and being positioned outwardly of said siderails,

(d) pivot means pivotally joining intermediate portions of said siderails and legs on each side thereof for movement between collapsed generally vertical positions for hiking and extended open positions forming a chair, portions of said legs located above said pivot means when in the closed position being movable about said pivot means rearwardly of said primary frame into said open position for engagement with a ground surface portions of said siderails located below said pivot means being engageable with the ground surface at locations forwardly of said leg portions, and portions of said legs located below said pivot means when in the closed position being movable about said pivot means forwardly of said primary frame into said open position projecting from the plane of said primary frame to form a seat frame,

(e) and means for connecting said primary and supplemental frames below said pivot means in said open positions thereof, and wherein said legs have main body portions and foot portions located at ends opposite the cross-bar, said foot portions extending at an angle relative to said main body portions such that when the legs are in said open position the portions extend generally vertically for engaging the ground.

4,489,867

ARM BAND CARRYING DEVICE

Michael Schwemberger, 1280 Panorama Dr., Lafayette, Calif. 94549

Filed Aug. 30, 1982, Ser. No. 412,769
Int. Cl.³ A45F 5/00
U.S. Cl. 224—222 14 Claims

1. A carrying device adapted to be worn on a person's arm for holding at least one small item for occasional use by the person, the carrying device having a storage mode in which the at least one small item is stored adjacent to the person's lower arm and an access mode in which the at least one small item is accessable for use by the person, the carrying device comprising:

a flat annular band member adapted to fit snugly around the person's lower arm, and having sufficient width so as to prevent slipping and twisting on the person's arm;

an opague flat strap member having a captive end connected to the band member and a free end, the free end having a storage position in which the strap member is secured concentrically around and over the band member adjacent to the person's lower arm with the at least one small item stored and substantially obscured between the band member and the opaque strap member, and the free end having an access position in which the free end is released from the band member, the strap member has sufficient length when in the access position to permit the at least one small item retained on the free end thereof to be conveniently manipulated by the person using the hand of the arm on which the carrying device is worn;

item retaining means at the free end of the strap member adapted to retain the at least one small item on the free end of the strap member when in the access position;

band securing means on the band member;

strap securing means on the strap member proximate the free end thereof for releaseably engaging the band member securing means to secure the strap member in the concentric storage position over the band member; and

grasping means on the strap member at the free end thereof for permitting the person to pull the strap member away from the band member causing the securing means to release and moving the strap member from the storage position into the access position; wherein the band member and the strap member are formed of a single piece of flat material.

4,489,868

LUGGAGE RACK

Paul J. Thirion, Payette, Id., assignor to L. B. Industries, Inc., Boise, Id.

Filed Jan. 9, 1984, Ser. No. 569,386
Int. Cl.³ B60R 9/04
U.S. Cl. 224—321 9 Claims

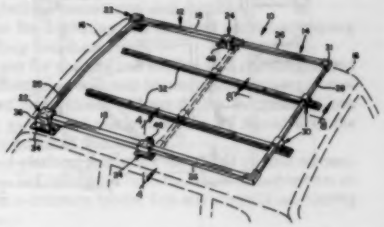
1. A vehicle luggage rack comprising:

a pair of longitudinally extending, parallel frame members, each having a first and a second end and being adapted to be fixed to a vehicle;

a pair of longitudinally extending, parallel slide members, each of which is slidably mounted to and aligned with one of said longitudinal frame members adjacent said first end thereof;

a transverse rail extending between said longitudinal slide members to form a slide/transverse rail assembly, said transverse rail having follower means thereon;

at least one longitudinally extending guide rail disposed parallel to said longitudinal members in transverse alignment with said transverse rail follower means, said guide rail being adapted to be fixed to the vehicle;



means for slidably mounting said transverse rail follower means to said guide rail so that said slide/transverse rail assembly is longitudinally slidable with respect to said longitudinal frame members and said guide rail; and

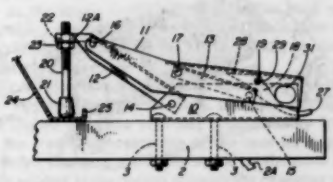
means for releasably fixing the position of said slide/transverse rail assembly with respect to said longitudinal frame members.

4,489,869

BURGLAR PROOF CLAMP FOR CAR ROOF CARRIERS

Edgar K. Wienhold, 1100 Lamar Dr., and Donald Tomm, 436 Strathcona Ter., both of Kamloops, British Columbia, Canada

Filed Feb. 10, 1983, Ser. No. 465,547
Claims priority, application Canada, Nov. 23, 1982, 416167
Int. Cl.³ B60R 9/04; A44B 21/00
U.S. Cl. 224—329 6 Claims

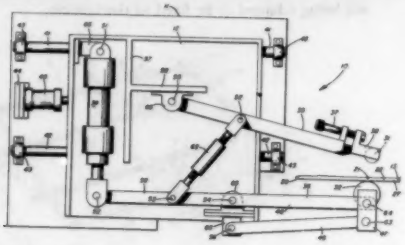


1. A clamping device for securing an article to a car top carrier comprising a base member adapted to be secured to said carrier, a lever arm, a pair of link arms each pivotally connected at opposite ends respectively to the base member and lever arms with the pivot axes thereof spaced apart from one another and so arranged as to lock in an over-center article clamp down position, an article engaging member secured to one of said link arms, said article engaging member being selectively variable in length and projecting downwardly to press an article on the carrier against said carrier and a finger operable lever lock means pivotally attached to the lever arm and engageable with the other link arm for locking the lever arm in an article securing position.

4,489,870
APPARATUS FOR SEVERING EDGES OF A GLASS SHEET

Bernard H. Prange, and Dale J. Helenschmidt, both of Burkburnett, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 25, 1982, Ser. No. 411,195
Int. Cl.³ C03B 33/02
U.S. Cl. 225—2 **22 Claims**



20. A method of severing the edges of glass sheets, said sheets of a type having an upper surface, a lower surface, a trailing end, a leading end and a score line imposed upon said upper surface, said method comprising the steps of:

a. providing a lower mandrel means for engaging said trailing end of said glass sheet beneath said score line;

b. raising said glass sheet by raising said lower mandrel means;

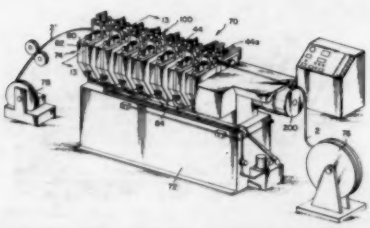
c. providing an upper mandrel means for engaging the upper trailing edge of said sheet; and

d. applying a downward and outward force against said glass sheet by contact with said upper mandrel means.

4,489,871
STRIP FEEDING APPARATUS

Johannes C. W. Bakermans, Harrisburg, Pa., and Dimitry G. Grabbe, Lisbon Falls, Me., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 24, 1982, Ser. No. 444,291
Int. Cl.³ G03B 1/18; B65H 17/24
U.S. Cl. 226—52 **22 Claims**



1. Strip feeding apparatus for feeding strip along a strip feed path, the strip having at least one straight edge and having notches in the straight edge at spaced intervals, the strip feeding apparatus being of the type comprising a strip feeder, an edge guide, and a side guide, the edge guide and the side guide extending at least partially along the feed path and serving to guide the strip along the feed path while the strip is being fed by the feeder, the apparatus being characterized in that:

the strip feeder comprises a thread support and a feeding thread on the surface of the thread support, the thread support being mounted for rotation on an axis of rotation which extends substantially parallel to the strip feed path and adjacent to the straight edge of a strip on the feed path, the thread being dimensioned to be received in the notches in the strip,

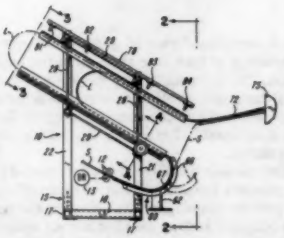
a strip retainer for maintaining the straight edge of the strip adjacent to the thread support with the thread extending into at least one notch in the strip, and

an actuating means for rotating the thread support whereby, during rotation of the thread support, the thread moves the strip along the strip feed path.

4,489,872
APPARATUS FOR PRODUCING A LOOP WITHIN A METAL STRIP

David R. Bolton; Charles A. Koverman, and Marvin L. Neargarder, all of Piqua, Ohio, assignors to Perfecto Industries, Inc., Piqua, Ohio

Filed Aug. 9, 1982, Ser. No. 406,355
Int. Cl.³ B65H 17/42, 23/32
U.S. Cl. 226—117 **19 Claims**



1. Apparatus for producing a U-shaped loop within a flexible sheet metal strip having a predetermined width and adapted to be located between a continuously operating strip straightening device and an incremental strip feeding device, said apparatus comprising a first pair of elongated magnets positioned in substantially parallel horizontally spaced opposing relation, a second pair of elongated magnets positioned in substantially parallel horizontally spaced opposing relation, said first and second pairs of magnets being arranged to receive a U-shaped loop within the strip with each pair of magnets being spaced slightly greater than the width of the strip and adjacent opposite longitudinal edges of the strip, said pairs of magnets being effective to support the loop between the magnets and to provide for movement of the strip longitudinally along different U-shaped paths between each said pair of magnets, and means for feeding the strip longitudinally between said magnets.

4,489,873
INTERMITTENT FEED MECHANISM

Hiroshi Yoshida; Shunji Akashi, both of Kurobe, and Kazuki Kuse, Toyama, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Apr. 27, 1983, Ser. No. 489,125
Claims priority, application Japan, Apr. 28, 1982, 57-71762
Int. Cl.³ B65H 17/36, 17/44
U.S. Cl. 226—162 **5 Claims**

1. A mechanism for intermittently feeding a continuous tape-like article to a slide fastener chain, said mechanism comprising:

(a) a fixed elongated guide block for guiding the tape-like article along a longitudinal path;

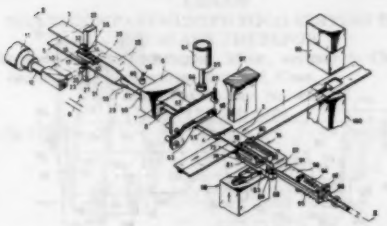
(b) a slide supported by said guide blcok and movable relatively thereto in parallel relation to said longitudinal path, said slide having a first clamping jaw projecting therefrom for supporting the tape-like article on one surface thereof;

(c) means for reciprocably moving said slide between an advanced position and a retracted position along said guide block;

(d) a bracket secured to said slide and carrying a second clamping jaw movable relatively to said bracket perpendicularly to said longitudinal path between a "clamping" position in which said second clamping jaw is disposed close to said first clamping jaw to clamp therewith the tape-like article, and a "releasing" position in which said second clamping jaw is disposed away from said first clamping jaw to release the tape-like article;

(e) a first spring hereinafter called first spring acting between said bracket and said second clamping jaw and normally urging the latter to said "clamping" position;

(f) a cam plate disposed in a traveling path of said second clamping jaw at an adjustable position adjacent to a downstream end of said traveling path, said cam plate being



engageable, when said slide approaches near said advanced position, with said second clamping jaw to cause the latter to be moved from said "clamping" position to said "releasing" position against the biasing force of said first spring;

(g) locking means carried on said bracket and operable, when said clamping jaw comes to said "releasing" position, to lockingly engage said second clamping jaw; and

(h) unlocking means disposed adjacent to an upstream end of said traveling path of said second clamping jaw and operable, when said slide approaches near said retracted position, to cause said locking means to move out of locking engagement with said second clamping jaw, which is thereby allowed to return to said "clamping" position under force from said first spring.

4,489,874

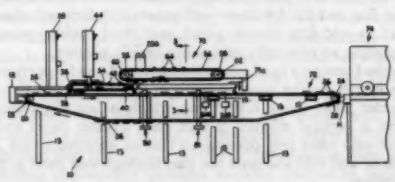
PALLET MANUFACTURING MACHINE

Joel G. Worst; William G. Grutter, both of Grand Rapids, and Walter C. Bramer, Norton Shores, all of Mich., assignors to World Wide Innovations, Inc., Grand Rapids, Mich.

Filed Sep. 13, 1982, Ser. No. 417,151

Int. Cl.[3] **B21J** *15/28;* **B27F** *7/17;* **B25C** *7/00*

U.S. Cl. 227—7 **38 Claims**



1. A machine for assembling wooden members and elongate splines having front and back ends and edge portions extending along the length of the spline into an integrated structure wherein said wooden members form first and second platform means in spaced planes joined together by spaced elongate splines for supporting loads thereon, said machine comprising:

a frame;

spline clamping means mounted on said frame, said spline clamping means adapted to selectively grip the sides of the elongate spline in a spaced apart relationship and release the elongate splines so that the edge portions of the spline extend from said clamping means;

first and second advancing means for carrying first and second platform means along said frame and parallel to the elongate axes of the clamped splines;

said first and second advancing means adapted to force said first and second platform means over and onto the extending edges of said splines so as to embed said first and second platform means onto said splines;

drive means for displacing said first and second advancing means along said frame; and

control means for opening and closing said clamping means in synchronization with said advancing means, said clamping means being closed at least during the period when said first and second platform means are forced over the extending edges of said splines;

wherein said platform means are supported on said advancing means and embedded onto the edges of said splines so as to form a structure having first and second load-bearing platforms.

4,489,875

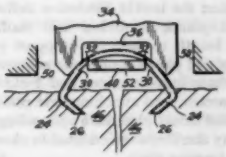
SELF-CENTERING SURGICAL STAPLE AND STAPLER FOR APPLYING THE SAME

John O. Crawford, Bookfield Center, and Roy D. Gravener, Bethany, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 194,407, Oct. 17, 1980, abandoned. This application May 25, 1982, Ser. No. 381,865

Int. Cl.[3] **A61B** *17/10*

U.S. Cl. 227—19 **8 Claims**



1. In combination:

(a) a surgical stapler having means for forming a surgical staple as the staple is applied to a patient, said means comprising a pusher and an anvil having shoulders about which the staple is bent by the pusher during application of the staple; and

(b) a self-centering surgical staple comprising a base and a pair of legs connected to the base, said base having two means spaced from the legs and symmetrically located about the transverse centerline of the base for engaging the forming means to center the staple on the anvil as the staple is applied to the patient wherein the engaging means are on the side of the base contacted by the shoulders of the anvil during application of the staple.

4,489,876

METHOD OF MAKING A FABRICATED SHEET METAL COMPRESSION MOLD

Leonard S. Meyer, Columbia, S.C.; Michael J. Murray, Orange Lake, Fla.; Gerald G. Hayes, and Robert L. McClain, both of Gainesville, Fla., assignors to Kidde Recreation Products, Inc., Northbrook, Ill.

Division of Ser. No. 228,703, Jan. 23, 1981, Pat. No. 4,390,156. This application Mar. 29, 1983, Ser. No. 481,142

Int. Cl.[3] **B23K** *31/00*

U.S. Cl. 228—170 **8 Claims**

1. The method of making punch and cavity compression

mold elements from stock comprising plate material, including the steps: forming a punch element by providing a base plate, cutting a pair of side plates to provide side plates each having contoured edges opposite planar edges, affixing said side plate planar edges to said base plate with said side plates laterally spaced apart to provide a chamber therebetween, providing a punch forming plate having a width no less than the lateral dimension defined by said two affixed side plates, attaching said forming plate throughout its length to said two side plates contoured edges, mounting end plates at opposite portions of said base plate, side plates and forming plate to enclose said chamber, forming said contoured edges of said side plates with a concave configuration, and said method includes pre-forming said punch forming plate with a radius less than that of said contoured edges of said side plates with said attaching of said forming plate beginning at the medial point of the forming

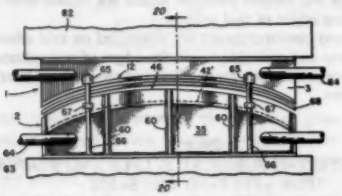


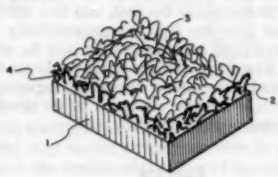
plate and progressing to the end thereof; and forming a cavity element adapted to cooperate with said punch element by providing a base plate, cutting a pair of support plates to provide contoured edges and oppositely disposed planar edges, affixing said support plate planar edges to said cavity base plate with said support plates laterally spaced apart to provide a chamber therebetween, providing a mold cavity plate having a width no less than the lateral dimension defined by said two affixed support plates, attaching said mold cavity plate throughout its length to said two support plate contoured edges, mounting end plates at opposite portions of said cavity element base plate, support plates and mold cavity plate to enclose said chamber, and attaching side plates to the lateral edges of said mold cavity plate with upstanding portions defining a mold cavity therebetween adapted to closely receive said punch element forming plate.

4,489,877

PROCESS FOR BONDING REFRACTORY TO SURFACES

Cord H. Sump, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 3, 1982, Ser. No. 446,734
Int. Cl.³ B23K *1/04*
U.S. Cl. 228—178 **6 Claims**



1. A process for bonding randomly arranged structural metal fibers to each other at their points of contact and to the surface of a substrate on which the fibers rest, including,

dispersing a finely-divided brazing material through a viscous liquid-like material which will evaporate and leave no residue,

coating the metal fibers with the mixture of brazing material and viscous liquid-like material to spread the brazing material evenly over the fibers,

forming the coated metal fibers in a layer over the surface of the substrate to which it is to be bonded,

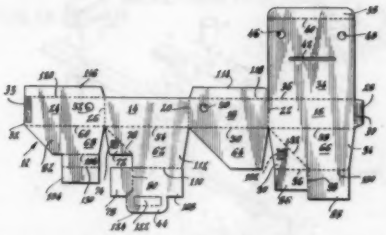
and placing the coated metal fibers and substrate in an atmosphere having a temperature high enough to evaporate the liquid-like material and braze the metal fibers together and the fibers to the substrate with the brazing material.

4,489,878

AUTO-DIVIDE CARTON WITH UNEQUAL CELLS

Duane Mode, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Jan. 14, 1983, Ser. No. 457,870
Int. Cl.³ B65D *5/46, 5/48, 5/36*
U.S. Cl. 229—27 **2 Claims**



1. A paperboard carton having a plurality of internal cells of varying size, said carton comprising:

(a) a front wall panel;

(b) a rear wall panel;

(c) a pair of side wall panels;

(d) said front, rear and side wall panels being foldably connected together in series to form sides for said carton;

(e) a first bottom wall panel foldably connected to said front wall panel;

(f) a second bottom wall panel foldably connected to one of said side wall panels;

(g) a third bottom wall panel foldably connected to said rear wall panel;

(h) a fourth bottom wall panel foldably connected to the other of said side wall panels;

(i) a first divider panel foldably connected to one of said first and third bottom wall panels;

(j) a second divider panel foldably connected to said first divider panel, said second divider panel being foldably connected to a first triangular glue panel which is also foldably connected to said one of said first and third bottom wall panels, said first triangular glue panel providing a foldable connection between said first and second bottom wall panels;

(k) a third divider panel foldably connected to the other of said first and third bottom wall panels and disposed adjacent to said first divider panel, said third divider panel including an upwardly projecting handle portion;

(l) means forming a hand grip opening in said handle portion;

(m) a fourth divider panel foldably connected to said third divider panel along a fold line which is laterally offset from a vertical midline of said third divider panel and from said hand grip opening so that an imaginary extension of said fold line does not pass through said hand grip opening;

(n) a fifth divider panel foldably connected to said fourth bottom wall panel, said fifth divider panel lying adjacent to said fourth divider panel;

(o) a second triangular glue panel foldably connected to said other of said first and third bottom wall panels and free of connection with said third divider panel, said second triangular glue panel being operable to provide a foldable connection between said third and fourth bottom wall panels; and

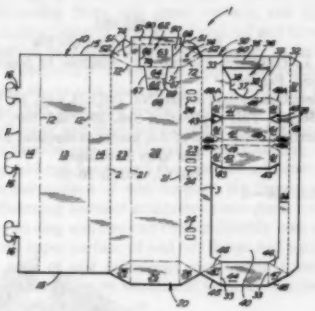
(p) said first divider panel and said third divider panel being operable to divide said carton interior into two substantially equal compartments between said front wall panel and said rear wall panel, said second divider panel being operable to divide one of said compartments into substantially equal cells, and said fourth and fifth divider panels being operable to divide the other of said compartments into substantially unequal cells.

4,489,879

MULTI-COMPARTMENTED FOOD SERVING TRAY AND BLANK THEREFOR

Duane R. Mode, Bloomington, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed May 25, 1983, Ser. No. 498,137
Int. Cl.³ B65D 5/48
U.S. Cl. 229—27 **21 Claims**



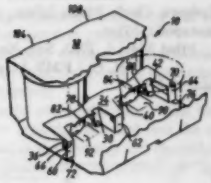
1. A one-piece tray comprising a bottom wall and a top wall having longitudinal side edges and an end edge perpendicular to said longitudinal side edges, said bottom and top walls being hingedly connected to each other along a longitudinal side edge in overlying relationship to each other, said bottom wall having an end spacer wall panel adapted to be folded relative thereto to space the top wall from the bottom wall, said top wall having a plurality of food-receiving openings therein, additional spacer means foldable relative to and extending from at least one of said walls and adapted to space the top wall above the bottom wall, one of said food-receiving openings comprising a cup-receiving opening, said bottom wall and end spacer wall having a cup-supporting assembly formed therein underlying said cup-receiving opening, said cup-supporting assembly comprising a pair of opposed longitudinally oriented slits in said bottom and end spacer walls connected together by a pair of first and second transverse fold lines, said first transverse fold lines being in said bottom wall and said second transverse fold lines being in said end spacer wall, a third transverse fold line in said cup-supporting assembly intermediate said first and second transverse fold lines to form top and bottom cup-support portions foldable relative to each other along said transverse fold lines, said top cup-support portion being movable from a position flush with the end spacer wall to a position adjacent the top wall to form an opening in the end spacer wall, and the bottom cup-support portion movable from a position flush with the bottom wall, to support a cup in said cup-receiving opening, to a position within the tray at an angle to said top wall to form a ledge to support a cup extending through the opening in the end spacer wall.

4,489,880

TAPERED CUP PACKAGE

Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed May 12, 1983, Ser. No. 493,881
Claims priority, application United Kingdom, Jul. 20, 1982, 8220907
Int. Cl.³ B65D 5/02
U.S. Cl. 229—40 **7 Claims**



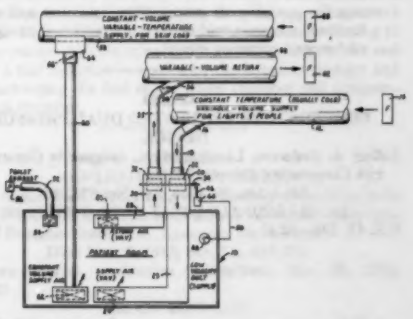
1. A package of the wrap-around type including a wrapper formed from paperboard or similar foldable sheet material and accommodating containers arranged in two parallel rows, which package comprises a top wall, opposing side walls and base panels joined to said side walls along fold lines remote from said top wall, a keel construction foldably joined to one of said base panels and providing support for each container and separating one row of containers from the other row, said keel construction being released by cuts from said one base panel and including a separator platform held substantially parallel to said one base panel by a plurality of support legs each of which is hinged to said one base panel and to one side of the separator platform.

4,489,881

AIR DELIVERY SYSTEM FOR HOSPITAL ROOMS AND THE LIKE

Raymond H. Dean, Shawnee Mission, and Michael M. Roberts, Leawood, both of Kans., assignors to Tempmaster Corporation, Kansas City, Mo.

Filed Jan. 30, 1984, Ser. No. 575,458
Int. Cl.³ F24F 7/00
U.S. Cl. 236—49 **18 Claims**



1. A method of delivering conditioned air to a room which is to be maintained at a pressure level different from adjacent areas, said method comprising the steps of:

forcing air into the room at a constant inflow rate;

exhausting air from the room at a constant outflow rate having a relationship to the inflow rate to maintain the room at said different pressure level;

supplying conditioned air to the room at a variable inflow rate;

removing air from the room at a variable outflow rate; and

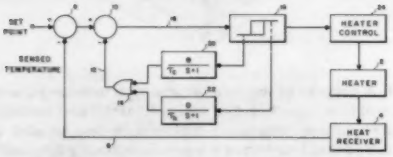
varying the variable inflow and variable outflow rates to vary the amount of conditioned air supplied to the room in accordance with the demand therefor while constantly maintaining substantial equality between the variable inflow rate and the variable outflow rate.

4,489,882

VARIABLE TIME CONSTANT ANTICIPATION THERMOSTAT

Larry C. Rodgers, Circle Pines, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 4, 1983, Ser. No. 472,419
Int. Cl.³ F24F 3/14
U.S. Cl. 236—78 D **8 Claims**



1. A thermostat comprising

a first signal summing means for producing an output representative of the difference between a temperature setpoint and a sensed temperature.

a second signal summing means for producing an output representative of the difference between the output from said first summing means and a temperature anticipation signal,

ON-OFF heater control means responsive to the output of the second summing means for producing a heater control signal during an ON mode of operation and during an OFF mode of operation,

first feedback means for producing a feedback of a first anticipation signal having a first time constant from the output of said control means during the OFF operating mode of said control means,

second feedback means for producing a feedback of a second anticipation signal having a second time constant different from said first time constant from the output of said control means during the ON operating mode of said control means, and

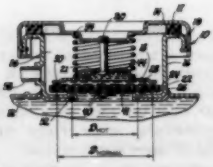
means for applying an output from said first and second feedback means as said temperature anticipation signal to said second summing means.

4,489,883

TEMPERATURE REGULATED DUAL PRESSURE DEVICE

Jeffrey A. Anderson, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 19, 1984, Ser. No. 571,940
Int. Cl.³ B65D 51/16; F16K 24/04; G05D 16/00
U.S. Cl. 236—92 C **3 Claims**



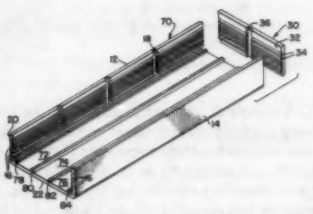
1. A temperature regulated dual pressure device for a fluid system comprising blow off valve means movable against spring means from a normally closed to an open position so as to vent the system, said blow off valve means having a small and large pressure responsive valve area adapted to be continuously and controllably exposed, respectively, to the system pressure so that the latter acting on said small and large valve area is effective to open said blow off valve means against said spring means at a low and high system pressure, respectively, and temperature actuated valve means adapted to normally open said large valve area to the system below a predetermined system temperature and close communication therewith thereabove whereby the system pressure required to open said blow off valve means is higher at system temperatures above said predetermined system temperature.

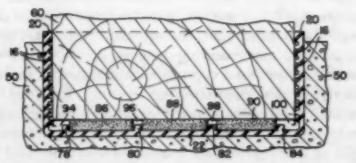
4,489,884

RAILROAD TIE COVER

John L. Harmsen, Vienna, Va., assignor to Stedef S.A., Saint Cloud, France

Continuation-in-part of Ser. No. 195,921, Oct. 10, 1980, Pat. No. 4,356,968. This application Sep. 30, 1982, Ser. No. 429,271
The portion of the term of this patent subsequent to Nov. 2, 1999, has been disclaimed.
Int. Cl.³ E01B 26/00
U.S. Cl. 238—1 **10 Claims**





1. A railroad tie cover for imparting resiliency to a track system while prolonging the life of a tie comprising a substantially rectangular sheet formed of an elastomer material having an inside surface adapted to contact a portion of the surface of a railroad tie and an outside surface opposite said inside surface said surfaces providing a center portion having one or more grooves to provide a static stiffness in the range of about 5 lbs. to 40 lbs. per millimeter deflection per square inch and a first side and a second side said sides connected to said center portion and adapted to deform so as to orient said inside surface of said first and second sides to an angle of about 90 degrees to said inside surface of said center portion.

4,489,885

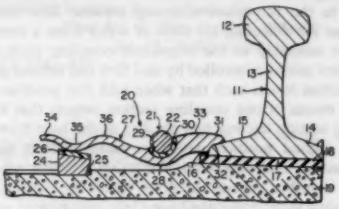
RAIL FASTENING SYSTEM

James S. Bryan, Haywood County, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Aug. 2, 1982, Ser. No. 404,101

Int. Cl.³ E01B *9/30, 9/62, 9/68*

U.S. Cl. 238—349 **16 Claims**



1. In a system for fastening a rail to a foundation, said rail having a rail flange provided with an upper surface and an outer edge depending from said upper surface, said system comprising a support located laterally of said rail and mounted on said foundation, said support having an upper surface, an insert located between said rail and said support and embedded in and extending above said foundation, and a fastening member having opposed ends and securing said rail in place by being mounted under and disposed against said insert intermediate said ends thereof, one of said ends of said fastening member contacting said rail flange and the other of said ends contacting said upper surface of said support; the improvement wherein said fastening member comprises a one-piece resilient spring member having said one end thereof directly contacting a portion of said upper surface of said rail flange and a portion of said outer edge of said rail flange and having a multiple curved cross-section to apply lateral and vertical compressive forces to said rail flange.

4,489,886

FUEL INJECTION APPARATUS

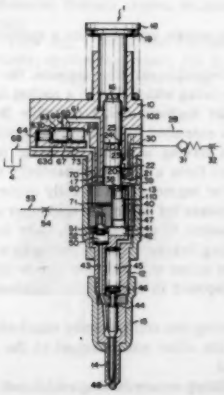
Masaaki Kato, Toyoake, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 24, 1982, Ser. No. 423,308

Claims priority, application Japan, Oct. 5, 1981, 56-148026

Int. Cl.³ F02M *51/00*

U.S. Cl. 239—88 **14 Claims**



1. A fuel injection apparatus comprising:

(1) a unit fuel injector for injecting fuel into a cylinder of an internal combustion engine including;

(a) a housing having a first bore and a second bore,

(b) a pumping plunger reciprocally inserted into the first bore and driven by and in synchronism with the engine,

(c) a pump chamber defined by the first bore and pumping plunger,

(d) an injection plunger reciprocally inserted into the second bore,

(e) an injection pump chamber defined by the second bore and one end of the injection plunger,

(f) a compression chamber defined by the second bore and the other end of the injection plunger and communicating with the pump chamber;

(g) an injection nozzle communicating with the injection pump chamber for injecting the fuel into the cylinder,

(h) a feed port formed in the housing and operatively opened into the pump chamber for supplying the fuel into the pump chamber,

(i) a timing port formed in the housing and operatively opened into the pump chamber, said timing port being formed at such a position as to be closed by the pumping plunger after the feed port has been closed by the pumping plunger,

(j) a fuel supply passage communicating with the injection pump chamber for supplying the fuel to the injection pump chamber, and

(k) a check valve provided in the fuel supply passage for checking a back flow of the fuel which is supplied to the injection pump chamber,

(2) a fuel tank;

(3) a pump for pressurizing the fuel from the fuel tank to a predetermined pressure level;

(4) metering means permitting communication between the pump and the fuel supply passage for metering the fuel supplied to the injection pump chamber;

(5) timing control means communicating with the timing port through a timing passage for setting a fuel injection start time by closing the timing passage;

(6) an orifice provided in the timing passage;

(7) means communicating with the feed port for supplying the fuel to the pump chamber when the pumping plunger is raised;

(8) an escape port formed in the housing and opened into the pump chamber, said escape port being provided in such a position as not to be blocked by the pumping plunger; and

(9) discharge means provided on a return passage leading to the escape port for opening the return passage at the end of a fuel injection operation by the injection plunger and discharging the fuel in the pump chamber and compression chamber.

4,489,887

AGGLOMERATION NOZZLE

Ernest Badertscher, Orbe, and Pierre Grobety, Neuchatel, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Nov. 9, 1982, Ser. No. 440,261

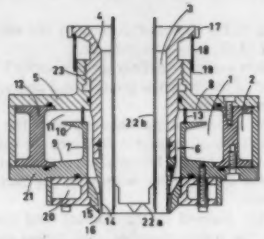
Claims priority, application Switzerland, Nov. 30, 1981, 7645/81

Int. Cl.³ B05B *1/24*

U.S. Cl. 239—132.1 **8 Claims**

1. An agglomeration nozzle comprising a main housing having a vertical, axial opening in which the following elements are provided: an axial passage for the admission of a pulverulent product to be agglomerated, at least one annular discharge duct which is coaxial with and outside the axial passage for the discharge of an agglomeration fluid, and at least one annular distribution chamber which is coaxial with and outside the duct for the distribution of the agglomeration fluid into the duct, the nozzle also comprising at least one first annular, coaxial heating chamber which is outside and adjacent the distribution chamber for heating the distribution chamber

and at least one second annular, coaxial heating chamber which is outside and adjacent the end of the duct, said second heating chamber being positioned below the distribution chamber for heating the distribution chamber and the outlet end of the duct the axial passage being defined by an inlet pipe which is screwed into the top part of the housing, said inlet pipe being



adjustable during operation bv rotation about its axis, the duct being defined on the inside by the external surface of the inlet pipe and on the outside by an inside surface of the distribution chamber, such surfaces defining a converging conical discharge slit adjacent the outlet end of the duct, whereby the width of the slit may be adjusted during operation by rotating the inlet pipe about its axis.

4,489,888

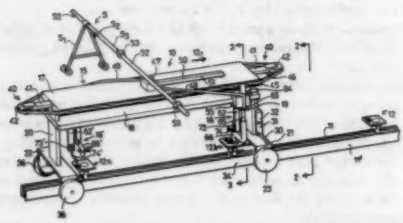
IRRIGATION SYSTEM

Isaac Rinkewich, 12 Fishman Maiman St., Tel Aviv, Israel 64236

Filed Oct. 28, 1982, Ser. No. 437,239

Int. Cl.³ B05B *3/00*

U.S. Cl. 239—183 **10 Claims**



1. Irrigation machine adapted to receive water from a water supply line located on the ground having thereon a plurality of valve assemblies equally spaced from each other comprising:

a base frame movable over the ground along said water supply line;

propelling means provided on said base frame for moving the base frame along the water supply line;

water transfer means mounted on said base frame for distributing water over the ground;

a coupling assembly carried by said base frame, said coupling assembly having at least two coupling sections connected to each other to freely move relative to said base frame so that when one of the coupling sections is moved in one direction along the longitudinal direction of the base frame, the other coupling section is thereby automatically moved in the opposite direction along the longitudinal direction of said base frame;

and means connecting said two coupling sections to said water transfer means supplying water thereto when either coupling section is connected to the water supply line by one of said valve assemblies; each of said two coupling sections including: first position detection means for detecting when the respective coupling section has reached the end of the base frame; second position detection means for detecting when the respective coupling section overlies a valve assembly; drive means for driving its respective coupling section to an extended position for engagement with a valve assembly, or to a retracted position for disengagement from a valve assembly; valve means controlling the flow of water from a connected valve assembly to the respective coupling section; flow detection means for detecting the flow of water from a connected valve assembly to the respective coupling section; and control means controlled by said first and second position detection means such that when said first position detection means of one coupling section detects that its coupling section has reached the end of the base frame, and said second position detection means detects that the respective coupling section overlies a valve assembly, they together actuate the drive means for the respective coupling section to extend same into engagement with the respective valve assembly, to cause the valve means for the respective coupling section to open and to produce a flow of water to the respective coupling section, whereupon the flow detection means for the respective coupling section closes the valve means of the other coupling section and actuates the drive means of the other coupling section to retract same from the previously-coupled valve assembly.

4,489,889

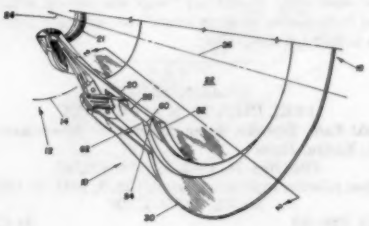
EXTENDIBLE NOZZLE EXIT CONE

Frank S. Inman, Brigham City, Utah, assignor to Thiokol Corporation, Chicago, Ill.

Filed Nov. 8, 1982, Ser. No. 439,706

Int. Cl.³ B64D *33/04*

U.S. Cl. 239—265.33 **11 Claims**



1. An extendible nozzle exit cone for a rocket motor comprising,

a plurality of concentric nozzle segments, the inner one of said segments being attachable to a rocket motor case, at least one outer segment being movable from a nested position to an extended fully deployed position, each of said segments having a divergent conic inner surface, which surfaces form a single substantially conic surface when said outer segment is in its fully deployed position,

folding linkage means for deploying said outer segment from the nested position to the extended, fully deployed position, said folding linkage means comprising a lever having a cam follower at one end, a slotted cam in which said cam follower is disposed in cooperative relation, and a first link,

said first link having one end pivotally attached to said outer segment and the other end attached to the other end of said lever, and

actuatable translating means having a first end and a second end the distance between which is extended upon actuation thereof,

said translating means having a pivotal connection at said

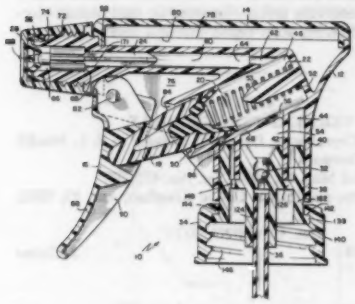
first end to said inner segment, and being intermediately pivoted at said second end to said lever.

4,489,890

HAND-OPERATED PUMP

Douglas S. Martin, Lawrenceville, Ga., assignor to Universal Dispensing Systems, Inc., Atlanta, Ga.

Filed Jul. 6, 1982, Ser. No. 395,685
Int. Cl.³ B05B *9/043*
U.S. Cl. 239—333 **8 Claims**



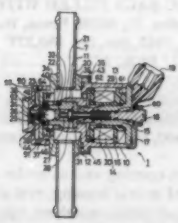
1. A hand-operated pump for dispensing a fluid from a container, the pump comprising a body containing a pumping chamber having an inlet and an outlet, a trigger connected to the body for varying the volume of the pumping chamber, and a nozzle assembly for controlling the release of fluid from the pump, the nozzle assembly having a centrally situated, forwardly facing, fixed protuberance, and an elastic, cup-shaped member secured at its periphery to the body, the cup-shaped member having a central aperture situated in contact with and closed by the fixed protuberance, the central aperture being defined by a cavity in the center of the interior surface of the member extending only partway through the member, at least two depressions on the exterior surface of the member spaced from each other yet each intersecting the cavity, and a swirl chamber situated between and connected to the depressions.

4,489,891

ELECTROMAGNETIC FUEL INJECTOR

Masakichi Momono, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 1, 1982, Ser. No. 394,641
Claims priority, application Japan, Jul. 2, 1981, 56-104235
Int. Cl.³ B05B *01/30*
U.S. Cl. 239—585 **5 Claims**



1. An electromagnetic fuel injector for internal combustion engines, the electromagnetic fuel injector comprising:

valve actuating means for electromagnetically actuating valve means, said actuating means including a coil, a movable armature, and a yoke containing said coil and said movable armature;

an axially extending member secured to said yoke, said member forming therein a valve seat portion with a central hole at a center thereof, an axially extending valve guide bore, a plurality of fine fuel passages positioned between said valve seat portion and one end of said valve guide bore, and a nozzle portion communicating with said fine fuel passages through said central hole;

a ball valve contained in said valve guide bore of said member and mechanically connected to said movable armature so as to be permitted to selectively rest on said valve seat portion and be kept away therefrom in accordance with an operation of said valve actuating means;

an axially extending holder means formed of a dense metal material for holding a pair of fuel pipes and for defining a fuel reservoir communicating with said pair of fuel pipes, said holder means having a small diameter portion mounted on said member with a small gap therebetween, and a large diameter portion which has a radially extending flat portion abutting on a flange portion radially extending from a periphery of said yoke and a cylindrical portion projecting axially from said radially extending flat portion enclosing a periphery of said flange portion of said yoke, an end of said cylindrical portion is deformed so as to secure said cylindrical portion to said yoke;

a first O-ring disposed between said member and said small diameter portion of said holder means, said first O-ring being adapted to be pressed in a radial direction; and

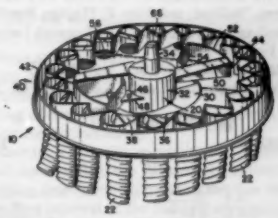
a second O-ring disposed at an abutment between said yoke and said holder means, said second O-ring being adapted to be pressed in an axial direction.

4,489,892

APPARATUS FOR DISTRIBUTING A SUBSTANCE

Loren E. Tyler, Benson, Minn., assignor to Lor-Al Corporation, Bendon, Minn.

Continuation of Ser. No. 375,384, May 6, 1982, Pat. No. 4,462,550. This application Mar. 20, 1984, Ser. No. 591,420
Int. Cl.³ A01C *15/04*
U.S. Cl. 239—650 **2 Claims**



1. An apparatus for distributing a substance from a container to a plurality of delivery tubes, said apparatus comprising:

means for elevating from a lower end to an upper end a continuous stream of said substance obtained from said container, said elevating means including an auger for rotation about an axis, said auger having a flight;

means for directing said stream outwardly away from the upper end of said elevating means, said directing means including a paddle extending radially outwardly from said axis; and

means for receiving said continuous stream and allowing portions of it to gravitationally fall into each of said delivery tubes, said receiving means including distributor pockets, each of said distributor pockets being formed by a wall having a pair of ends through which substance from said paddle passes before falling to one of said delivery tubes, whereby said flight, said paddle and said wall form a series

of closely cooperating surfaces for moving said substance to said delivery tubes.

4,489,893

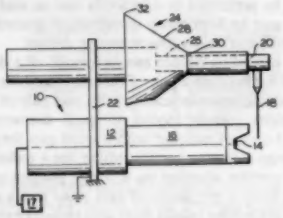
ELECTROSTATIC SPRAY GUN

Robert G. Smead, St. Charles, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 26, 1983, Ser. No. 498,363

Int. Cl.³ B05B 5/00

U.S. Cl. 239—691 **5 Claims**



1. In an electrostatic spray gun (10) having a nozzle (14) at a forward end (16) of said gun (10) for spraying an electrically conductive material therefrom, a source (17) of said electrically conductive material, an electrode (18) spaced from said nozzle (14), and an electrically grounded support member (22) operatively connected to said gun (10) at a position rearwardly of said nozzle (14), the improvement comprising:

means (20) for mounting the electrode (18) on the support member (22); and

shield means (24) positioned between said electrode (18) and said grounded support member (22) for protecting a preselected electrically non-conductive surface portion (26) of the gun (10) from deposition of the electrically conductive material and hence precluding the completion of an electrical circuit between said electrode (18) and said support member (22).

4,489,894

INDUCTIVELY CHARGED SPRAYING APPARATUS

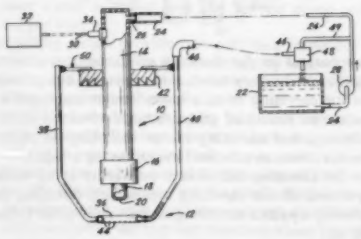
John A. Marchant, Bedford, and John F. Hughes, Southampton, both of England, assignors to National Research Development Corporation, London, England

Filed Feb. 25, 1982, Ser. No. 352,452

Claims priority, application United Kingdom, Feb. 27, 1981, 8106206

Int. Cl.³ B05B 5/00

U.S. Cl. 239—693 **16 Claims**



1. An electrostatic spraying apparatus, comprising:

a spray liquid supply means;

a spray head having a spray liquid inlet and a spray

a first electrode and a second electrode, including means supporting said first and second electrode on said apparatus for applying an electrical potential difference proximally of said spray exit, whereby emergent spray is inductively electrically charged;

said first electrode being associated with said spray head and arranged to be in electrical contact with spray liquid supplied by said spray liquid supply means to said spray head;

said second electrode comprising a hollow body having a wall provided with at least one aperture through which liquid deposited exteriorly on said wall may pass to the interior of said hollow body;

said second electrode being arranged in spaced relation to said spray exit; and

asperating means associated with the interior of said hollow body for removing liquid deposited on said second electrode by drawing such liquid through said at least one aperture.

4,489,895

VERTICAL ROLLER MILLS

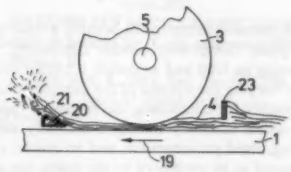
Luis Petersen, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Denmark

Filed Mar. 14, 1983, Ser. No. 475,297

Claims priority, application United Kingdom, Apr. 13, 1982, 8210767

Int. Cl.³ B02C 23/26

U.S. Cl. 241—19 **3 Claims**



1. A vertical roller mill comprising a mill housing surrounding a grinding table, means for rotating said grinding table about a vertical axis, at least one grinding roller rotating about a stationary axis and urged, in use, against a material layer on said grinding table to form a crushed material layer, and a nozzle ring encircling said grinding table for discharging, in use, air to convey away ground material; at least one scraper and a separate nozzle both positioned downstream, as considered in the direction of rotation of said grinding table, of said roller; said scraper being adapted to lift said crushed material layer from said grinding table; said separate nozzle being oriented and adapted so as to direct a blast of air, in use, against said crushed material layer lifted from said grinding table by said scraper.

4,489,896

PROCESSING APPARATUS FOR SOLID URBAN REFUSE AND PLASTIC BAGS FILLED WITH SAME

Manlio Cerroni, Via Bruxelles, 51, 00198 Roma, Italy

Filed Mar. 30, 1983, Ser. No. 480,277

Int. Cl.³ B02C 18/22

U.S. Cl. 241—36 **5 Claims**

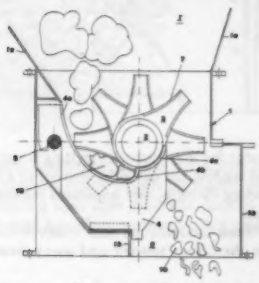
1. A processing apparatus capable of compacting and cutting material in the form of solid refuse and the bags in which the solid refuse may be contained, said process apparatus comprising

a housing having an inlet opening and an outlet opening,

a shaft rotatably mounted in said housing, said shaft fixedly mounting a plurality of blade members which include head portions which extend radially away from the shaft and which have cutting edges, the head portions of the blade members defining spaces therebetween and being sequentially angularly oriented about the shaft,

a platform formed by a plurality of parallel slat blades sta-

tionarily mounted in the housing, each slat blade being aligned with a respective space between the head portions of said blade members, and each slat blade including an upper edge shaped to provide a first, smooth, flattened curved surface portion which extends from the inlet opening of the housing to a point near and beneath said shaft, a second curved surface portion which extends abruptly upwardly from the end of the first curved surface portion beneath said shaft to a point nearer said rotary shaft, and a third curved surface portion which extends around a portion of said shaft from the end of the second curved portion nearest said shaft, the first surface portions of the slat blades causing material which has been fed to said housing through its inlet opening to be supported and to move toward the second surface portions thereof, said second surface portions acting as an abutment for the



material, the blade members mounted on said shaft first compacting and then cutting the material as the rotation of said shaft causes said blade members to sequentially move toward and into the spaces between the said slat blades, the cut material falling downwardly to and through said outlet opening, and said third surface portions of said slat blades preventing material from becoming wrapped or jammed about said shaft, and

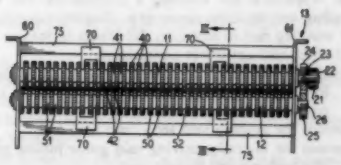
drive means connected to said shaft to slowly rotate it in a direction such that said blade members thereon compact and cut material in cooperation with said slat blades and upon sensing the presence of material which cannot be cut, will reverse the rotation of said shaft, causing the blade members thereon to lift the material which cannot be cut up and over said shaft and then drop it downwardly to and through said outlet opening.

4,489,897

APPARATUS FOR SHREDDING DOCUMENTS

Peter J. Turner, and Neal J. Morrissey, both of Chicago, Ill., assignors to General Binding Corporation, Northbrook, Ill.

Filed Mar. 2, 1983, Ser. No. 471,309
Int. Cl.³ B02C *18/16*
U.S. Cl. 241—167 **19 Claims**



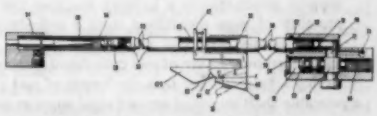
1. An apparatus for shredding paper comprising a frame, a pair of rotatable members, each member having a plurality of first cylindrical portions and a plurality of second cylindrical portions alternately arranged along an axis of the member with the first cylindrical portions having a larger diameter than the second cylindrical portions to provide an annular space adjacent each peripheral surface of the second portion and between adjacent first cylindrical portions, means for mounting the pair of members interdigitally for rotation in the frame with the first cylindrical portions of one of the pair of members being opposite the second cylindrical portions of the other member of the pair and extending into the annular space associated therewith so that the first cylindrical portions of the pair of members overlap each other and coact to shred material passing between the pair of members, means for rotating said pair of members, stripper means operatively extending into the annular spaces between said members to guide material into the rotating members and to remove material from the rotating members, and backup means for limiting bending of at least one of the members to prevent jamming of material during a shredding operation, said backup means including at least one yoke member having at least two fingers separated by a gap, each finger having an end surface, and means for mounting the yoke member with the fingers extending into the separate annular spaces between the first cylindrical portions with the end surface of each finger being at a point adjacent the peripheral surface of a second cylindrical portion disposed therebetween so that as the rotatable member begins to bend during shredding of material, the end surfaces of the fingers of each yoke member engage the peripheral surfaces to prevent further bending of the rotatable member.

4,489,898

METHOD AND APPARATUS FOR INITIATING THE WINDING OF FILAMENTARY MATERIAL UPON A WINDER TUBE

Max L. Cardell, Shelby, N.C., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,561
Int. Cl.³ B65H *54/02, 54/34*
U.S. Cl. 242—18 PW **6 Claims**



1. A winder for filamentary material, comprising:

means for rotating a tube about a longitudinal axis to wind-up filamentary material,

traversing means for guiding the filamentary material for traversing movement along the tube axis to effect a helical winding of the filamentary material upon the tube, and tail making means including:

constraining means for receiving the filamentary material and constraining the filamentary material against traversing movement along the tube axis during an initial winding interval of the filamentary material on the tube to form a waste bunch of filamentary material at an end of the tube,

blocking means for blocking egress of the filamentary material from said constraining means during said initial winding interval, and

ejecting means for displacing the filamentary material from said constraining means at the end of said initial winding interval, whereupon the filamentary material is traversed by said traversing means, said ejecting means including a stationary cam plate having a camming edge, said constraining means comprises a retainer plate carrying a slot, said retainer plate being positionable in a rest position to receive filamentary material within said slot and movable in a first direction relative to said cam plate to move said slot past said camming edge such that the latter pushes filamentary material from said slot, said blocking means comprising a stationary

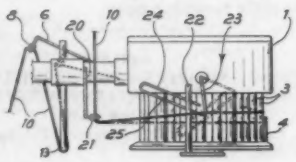
gate positioned such that movement of said retainer plate in a second direction from said rest position locates the filamentary material relative to said gate such that said gate blocks egress of the filamentary material from said slot, and means for moving said retainer plate in said first and second directions.

4,489,899

YARN FEEDING APPARATUS FOR MULTI-FEED KNITTING MACHINES

Sergio Calamani, and Eugenio Turri, both of Milan, Italy, assignors to Savio & C. S.p.A., Milan, Italy

Filed Apr. 28, 1983, Ser. No. 489,346
Claims priority, application Italy, May 13, 1982, 21228 A/82
Int. Cl.[3] B65H *51/22*
U.S. Cl. 242—47.01 8 Claims



1. A yarn feeding apparatus for multi-feed knitting machines, said apparatus comprising:

a wheel mounted for idle rotation about an axis on a rigid support attachable to a knitting machine and having a plurality of pegs distributed over a cylindrical surface thereof coaxial with said wheel;

a belt trained over an arc of said cylindrical surface, said belt having a height lower than the height of said pegs;

a rotatable shaft mounted on said rigid support and extending perpendicularly to said wheel axis and having two oscillating arms keyed thereto, said oscillating arms projecting from two diametrically opposed sides of said wheel and each carrying at the free end thereof an eye element to let the yarn through, said oscillating arms defining a yarn inlet arm positioned proximate to an area whereat said belt contacts said wheel, and a yarn outlet arm positioned proximate to an area whereat said belt separates from said wheel, said inlet and outlet arms being arranged to oscillate from an inoperative position wherein the yarn is held out of contact with said belt and said eye of said yarn inlet arm is shifted to a side of a plane containing the longitudinal side edge of said belt which is opposite said belt, and an operative position wherein the yarn is held level with said belt and the yarn inlet arm is shifted toward said belt, wherein said yarn inlet arm has a length dimension such that, in said operative position, the yarn inlet arm eye is shifted to the same side of said belt relatively to said plane containing the longitudinal side edge of said belt, and

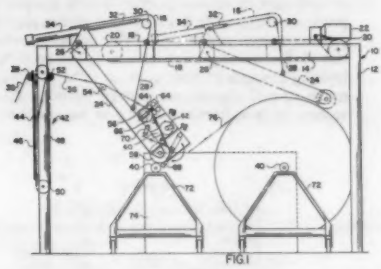
a fixed inlet eye wherethrough there is passed the yarn being fed to said eye of said yarn inlet arm which is located between said fixed eye and said belt, said fixed inlet eye being positioned in the proximity of said plane containing the belt longitudinal edge and being substantially aligned with said eye of said yarn inlet arm in the inoperative position thereof.

4,489,900

APPARATUS FOR AUTOMATICALLY CUTTING AND WINDING SHEET MATERIAL

Nicholas L. Morizzo, Cornwall, N.Y., assignor to Krantz America, Inc., Charlotte, N.C.

Filed Aug. 1, 1983, Ser. No. 518,962
Int. Cl.[3] B65H *19/20, 19/28*
U.S. Cl. 242—56 R 16 Claims



1. Apparatus for automatically cutting a travelling sheet of material and feeding the cut edge thereof to a driven receiver roll for winding thereon, said apparatus including:

(a) a frame;

(b) arm means mounted on said frame for selective movement in directions toward and away from said receiver roll;

(c) first and second driven roll means mounted in spaced relation on said arm means in driving contact with said material to move said material along a predetermined path of movement toward said receiver roll, said first driven roll means including engaging means selectively movable to an operative position for positively engaging said traveling material;

(d) cutting means disposed on said arm means between said first and second driven rolls and within said path of material movement for selectively cutting said moving material along an edge extending transversely of the direction of movement thereof;

(e) said second driven roll means being disposed on said arm means to selectively engage said surface of said receiver roll to form a nip therewith, said nip being substantially in said predetermined path of material movement whereby said cut edge of said material will be received by said nip to cause winding of said material about said receiver roll.

4,489,901

COIL WINDING APPARATUS

Poul Andersen, Wallingford, Conn., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed May 17, 1983, Ser. No. 495,369
Int. Cl.[3] B65H *17/20, 57/28*
U.S. Cl. 242—67.2 7 Claims

1. Apparatus for winding a continuous, flat strip onto a winding reel to form successive, abutting convolutions along the winding reel in multiple, flat layers to form a tight coil of said strip, said apparatus comprising

said winding reel being fixedly mounted and having means for imparting axial rotation to said reel to continuously wind said strip onto said reel;

means for guiding said strip onto said reel;

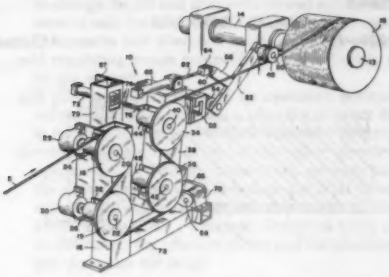
means for laterally moving said guide means generally axially with respect to said reel;

two movable bridle wheels mounted for rotation on generally parallel axes and defining a path of travel for said strip around said movable bridle wheels and to said guide means;

means for simultaneously moving said birdle wheels so that the strip leaving said bridle wheels is in substantial and

continuous longitudinal alignment with said guide means during said lateral movement of said guide means;

said guide means and said movable bridle wheels being connected to a common frame and means are provided for moving said frame and associated guide means and movable bridle wheels unitarily; and



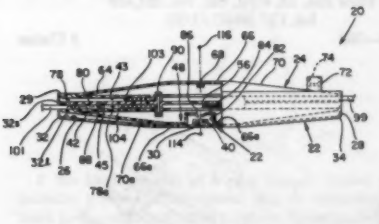
said frame being journaled so that upon moving of said frame, said movable bridle wheels tilt axially and unitarily while maintaining their axes generally parallel and simultaneously impart lateral movement to said guide means.

4,489,902

CORD CADDY

Peter C. Chaconas, Glyndon, and George W. Cowman, Monkton, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Dec. 2, 1982, Ser. No. 446,240
Int. Cl.³ B65H *75/38*
U.S. Cl. 242—100.1 **17 Claims**



1. A cord caddy for carrying a dispensable length of cord, comprising:

a. a housing;

b. a reel within said housing and having a central hub about which the cord is wound;

c. the cord having two ends extending in opposite directions from the housing;

d. means for mounting said reel in said housing to normally partake of both rotational and translational movement relative to said housing responsive to the application of tension force upon at least one of said cord ends, whereby said housing moves along a surface as said cord is dispensed from said reel; and

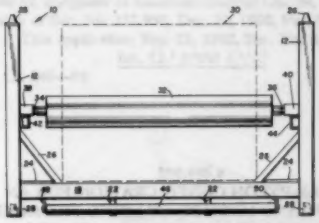
e. said means for mounting being normally essentially free of an axle journaling said hub to said housing.

4,489,903

STACK CREELING SYSTEM AND METHOD OF CONTINUOUSLY CREELING YARN

Robert A. Titzer, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Oct. 20, 1982, Ser. No. 435,402
Int. Cl.³ B65H *49/02*
U.S. Cl. 242—131 **17 Claims**



10. A vertically stackable creel frame comprising:

frame means for supporting a supply of yarn;

means associated with said frame means for journally supporting said yarn supply and for permitting removable placement of said yarn supply with said frame means; and

means permitting vertical stackable unity between said frame means and other similar ones of said frame means and including male member means formed on one end of said front and rear support posts and means defining a cavity formed in the other end of said front and rear support posts, said male member means of said frame means being receivable in said cavity defining means of a similar one of said frame means so as to establish vertical stackable unity between said frame means and said similar one;

roller means for preventing yarn from a yarn supply of a similar frame means inferiorly stacked with respect to said first mentioned frame means from rubbing against said first mentioned frame means; and

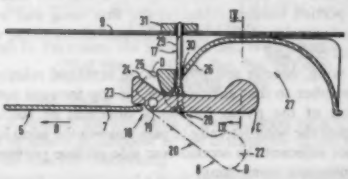
mounting means to removably mount said roller means to said first mentioned frame means to permit said roller means to be removably transferred to similar ones of said frame means.

4,489,904

ACTUATING MECHANISM FOR AN AUXILIARY POWER SOURCE

Richard Soederberg, Moeglingen, Fed. Rep. of Germany, assignor to Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Mar. 4, 1983, Ser. No. 472,113
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208150
Int. Cl.³ B64C *19/00*; B64D *33/00*
U.S. Cl. 244—75 R **14 Claims**



1. An actuating mechanism associated with a ram-air turbine comprising means for housing a movable slide means, movable slide means connected to a Bowden cable for controlling said

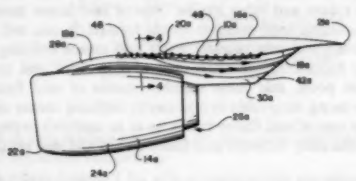
ram-air turbine, hand lever means pivotally supported by said movable slide means for moving said movable slide means, blocking means associated with said hand lever means for cooperating with said means for housing to preclude movement of said movable slide means, wherein pivoting of said hand lever means disengages the cooperation of said blocking means and said means for housing and moves said movable slide means.

4,489,905

NACELLE-PYLON CONFIGURATION FOR AN AIRCRAFT AND METHOD OF USING THE SAME

Ronald L. Bengelink, Renton, and Robert H. Wickemeyer, Redmond, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1981, Ser. No. 307,286
Int. Cl.³ B64D 29/02
U.S. Cl. 244—130 9 Claims



1. In an aircraft having:

a. a swept wing which has a first end and a second end, a leading edge, a trailing edge, an upper aerodynamic surface and a lower aerodynamic surface, said wing slanting rearwardly from said first end to said second end,

b. a nacelle positioned at a level below said wing, at least a portion of said nacelle being located forwardly of the wing leading edge,

c. a pylon by which said nacelle is mounted to the wing, said pylon having a forward pylon portion extending forwardly of the wing leading edge and a rear pylon portion positioned beneath the lower surface of the wing, said forward pylon portion having a first side forward surface portion positioned closer to the wing first end, a second side forward surface portion positioned closer to the wing second end, and a top forward surface portion extending between the first and second forward side surface portions, said rear pylon portion having a first rear side surface portion located closer to the first wing end and a second rear side surface portion located closer to the wing second end, and

d. said wing, nacelle and pylon being arranged relative to one another so that airflow over the top forward surface portion of the pylon follows a direction of rearward sweep of the wing laterally to pass beneath the wing lower surface adjacent the second rear side surface portion, an improvement comprising:

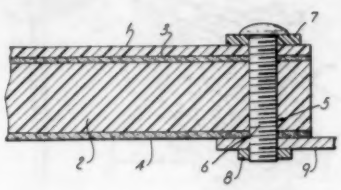
means to create a single discrete vortex at the top forward surface portion in a manner that the vortex travels along an area adjacent the wing lower surface and adjacent the second rear side surface portion, with the vortex being sufficiently strong to maintain attached flow in said area.

4,489,906

THERMAL CONTROL MATERIAL

Christakis N. Fellas, Stevenage, England, assignor to British Aerospace Public Limited Company, Weybridge, England

Continuation of Ser. No. 204,703, Nov. 6, 1980, abandoned. This application Aug. 24, 1983, Ser. No. 525,810
Claims priority, application United Kingdom, Nov. 8, 1979, 7938717; Jun. 2, 1980, 8018037; Jul. 12, 1980, 8022867; Sep. 4, 1980, 8028615
Int. Cl.³ B64G 1/58
U.S. Cl. 244—158 A 9 Claims



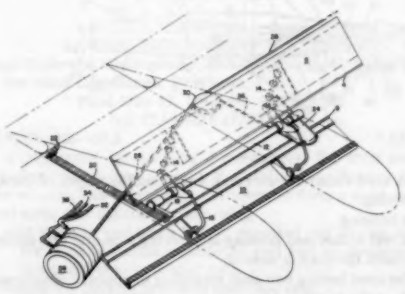
1. A spacecraft to which there is attached a flexible multilayer thermal control blanket, the blanket comprising an inner layer made of flexible thermally insulative plastics material, a flexible intermediate electrically conductive layer which extends continuously over the outer side of the inner layer and which is electrically connected to the spacecraft body, and an exposed outer layer which is made of flexible thermally insulative plastics material and which has a thickness such that at least a substantial proportion of electrons bombarding the spacecraft while it is in space come to rest at least near said conductive layer whereby the electrical charge associated with these electrons is able to flow away through the conductive layer to the spacecraft body.

4,489,907

SELECTIVELY INTEGRATED THROTTLE SPOILER ACTUATOR FOR AIRCRAFT

Harold R. Ziegelmeyer, Medford, Oreg., assignor to Precise Flight, Inc., Bend, Oreg.

Filed Jun. 23, 1982, Ser. No. 391,459
Int. Cl.³ B64C 13/36
U.S. Cl. 244—203 5 Claims



1. In an engine driven aircraft having lift and drag alteration means thereon,

a manually movable throttle control to regulate the speed of the engine,

said throttle control comprising a pilot movable rod which is moved in a forward and rearward direction to vary the speed of the engine,

fluid pressure means adapted to drive the alteration means to

actuate same and thereby vary the lift and drag ratio of the aircraft,

regulating means to control the connection of said fluid pressure means and said alteration means,

said regulating means and said throttle control being directly integrated whereby manual movement of said throttle control to lower range engine speeds causes the regulating means to connect the alteration means with said fluid pressure means whereby the alteration means are actuated to change the lift and drag ratio of said aircraft and movement of said throttle control to higher range engine speeds disconnects said alteration means and pressure means,

said regulating means comprising a valve fixedly mounted on the aircraft,

said pilot movable rod being an operative portion of said valve and pilot movable in a plurality of other directions in addition to said forward and rearward direction,

movement of said rod in one of said other directions being operative to selectively connect the pressure means and the alteration means and to actuate the latter concurrently with lower engine speeds and movement of the rod in another of said last mentioned directions being operative to disconnect the pressure means and the alteration means and deactuate the latter.

4,489,908

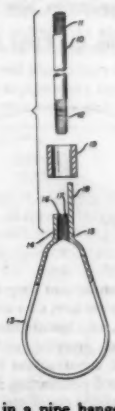
PIPE HANGER

Ray M. Rumble, Canfield, Ohio, assignor to Michigan Hanger Company, Hubbard, Ohio

Continuation-in-part of Ser. No. 257,599, Apr. 27, 1981,. This application Sep. 20, 1982, Ser. No. 420,019

Int. Cl.³ E21F *17/02*

U.S. Cl. 248—62 **3 Claims**



1. An improvement in a pipe hanger, which pipe hanger includes a threaded supported rod, an elongated distortable band to be positioned about a pipe to be suspended, the ends of said distortable band arranged in parallel positions adjacent one another and secured to said threaded support rod, the improvement comprising means securing said ends of said distortable band in engagement with said threaded support rod, means on said ends to cooperate with the threads on said rod said means consisting of end portions of unequal length on said distortable band oppositely disposed area of the opposite sides of said threaded support rod, one of said end portions being longer than the other and extending substantially further along said threaded support rod than said other end portion and a distortable cylindrical ferrule disposed coaxially of said support rod in tightly surrounding relationship with respect to said end portions of said distortable member thereby moving said end portions against said threaded support rod in non-slipping engagement therewith, said ferrule being of a length less than the length of said longer one of said end portions of said distortable band so that part of said longer end portion extends above said ferrule so as to be bendable outwardly and downwardly from said threaded support rod against said ferrule to distort a portion of said ferrule into locking engagement with said support rod.

4,489,909

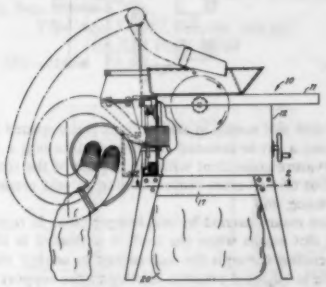
SAWDUST COLLECTOR BAG FOR A TABLE SAW

Daniel A. Terpstra, Kirkwood, and Richard Brundage, Ladue, both of, assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 217,950, Dec. 19, 1980, Pat. No. 4,367,665. This application Sep. 22, 1982, Ser. No. 421,435

Int. Cl.³ B65B *67/12*

U.S. Cl. 248—99 **4 Claims**



1. A collector bag and means for conveniently detachably connecting the open end thereof to the inner surface of vertical walls defining a downwardly directed opening through which waste material is ejected, said bag having a closed end and an open end, said open end being hemmed and arranged to extend upward into said opening, means resiliently holding a substantial portion of the hemmed periphery of said open end against said vertical walls comprising rod means in said hem extending longitudinally a substantial portion of the periphery of said hemmed open end, a plurality of spaced cutout portions of said hemmed open end to expose portions of said rod means, and a plurality of spaced clip elements attached to said walls and having the same spacing as said cutout portions for receiving and resiliently retaining said exposed portions of said rod means as said open end of said bag is moved upward into said opening, said clip elements each being elongated and vertically arranged on said walls and having an upper portion lying against and connected to one of said walls, an intermediate rod receiving notch formed therein adjacent said connected portion, and a lower portion diverging downward from said wall so as to provide a convenient approach to said retaining notch as said rod means in the hemmed open end of said bag is moved upward into said opening.

4,489,910

MOUNTING BRACKET FOR TRAFFIC SIGNAL INSTALLATION

Joseph D. Ferguson, 909 Fern Hill Rd., West Chester, Pa. 19380

Filed May 24, 1982, Ser. No. 381,405

Int. Cl.³ A47B *96/06*

U.S. Cl. 248—219.4 **12 Claims**

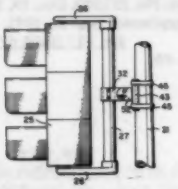
1. A bracket for mounting a traffic signal on a traffic standard to afford adjustment of the orientation of the traffic signal, the bracket comprising

a hanger member and a hook member, each having a mounting portion for attaching said member to one of the traffic signal and the traffic standard;

said hanger member having a hanger plate extending outwardly from said mounting portion, the hanger plate

having shaft means projecting perpendicularly therefrom, said mounting portion positioning said hanger plate substantially vertical and said shaft means substantially horizontal;

said hook member having a support piece extending outwardly from said mounting portion thereof, the support piece having an open-ended recess therein, the recess forming a hook for receiving the shaft, said shaft adapted to seat in the bottom of said recess and support the signal on the standard and afford pivotal adjustment of signal about the horizontal axis of said shaft when seated, an



arcuate slot means in said support piece spaced from said recess a predetermined distance and having a center of curvature coincident with the bottom of the recess and a radius of curvature corresponding to said predetermined distance; and

fastener means carried by said hanger plate, in registry with the slot means when the shaft is bottomed in the recess, extending through the slot means to anchor the hanger plate in adjusted position relative to the support piece for fixing the position of the hanger member relative to the hook member when the shaft is seated in the bottom of recess.

4,489,911

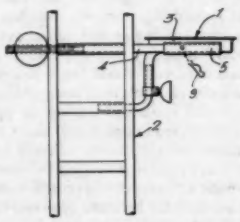
LADDER-MOUNTABLE DEVICE

Jack Riley, 30 Sandy Vale, Haywards Heath, West Sussex, England

Filed Feb. 22, 1983, Ser. No. 468,142

Int. Cl.³ E06C *7/14*

U.S. Cl. 248—238 **10 Claims**



1. A support device for installation on a ladder having hollow rungs, said support device comprising:

tray means, said tray means defining a plane;

first bracket means affixed to said tray means adjacent a first end thereof;

elongated support arm means, a first end of said support arm means being captured in said first bracket means, said support arm means extending outwardly from said tray means and being positioned by said bracket means so that at least a first portion thereof is parallel to said plane, said first portion of said support arm means having a size and shape which permits said arm means first portion to be received in a hollow ladder rung, said first portion of said support arm means having a length sufficient to permit said support arm means first portion to extend completely through a ladder rung whereby the second end of said support arm means will project outwardly from a first side of a ladder, said tray means thus being disposed on the opposite side of the ladder, at least a section of said support arm means first portion which projects outwardly from the first side of the ladder being externally threaded;

securing means, said securing means engaging said externally threaded section of said support arm means, said securing means being larger in at least one dimension than the inner diameter of the ladder rungs whereby said securing means prevents withdrawal of said support arm means from the ladder rung;

second bracket means, said bracket means being affixed to said tray means at a point displaced from said first bracket means; and

leveling arm means, said leveling arm means including a first rigid member which is engaged at a first end thereof by said second bracket means and a second rigid member which is sized and shaped at a first end thereof to be received in a ladder rung which is disposed beneath the rung through which said support arm means first portion extends, said first and second members being releasably joined together, the effective length of said leveling arm means being adjustable by imparting relative movement to said members to thereby vary the point at which they are joined, said leveling arm means further comprising means for locking said first and second members to one another at said point.

4,489,912

HANDLE

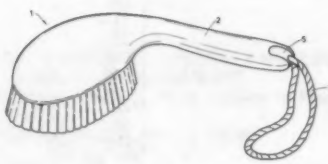
Peter F. Haythornthwaite, Auckland, New Zealand, assignor to Merryware Industries, Inc., Auckland, New Zealand

Filed Mar. 26, 1981, Ser. No. 247,804

Claims priority, application New Zealand, Mar. 26, 1980, 193270

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—359 **5 Claims**



1. An improved handle and loop-tie for an article adapted for retention on the wrist-arm of a user when the user releases a grip on said handle, said handle assembly including elongate base adapted for user grasping and a hollow cap member generally of U-shape construction having a hole through a mediate portion thereof, connecting means enabling the cap to be connected to a C-shape distal end of the elongate base, and a loop-like tie of flexible material with at least one portion thereof passing through the hole in the cap and being secured in a hollow space defined by the perpendicularly disposed intermeshing of said U-shape cap to said C-shape base.

4,489,913

ELECTROCONDUCTIVE FOAMS

Arthur E. Gurgiolo, Lake Jackson, and Thomas M. Knobel, Clute, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 19, 1984, Ser. No. 591,306

Int. Cl.³ C08J *9/36*

U.S. Cl. 521—53 **10 Claims**

1. A method for preparing an electroconductive foam which comprises:

(1) saturating a foam comprising a polymer containing a plurality of urethane or thiourethane or thiourea or isocy-

anurate or thioisocyanurate or a combination of such groups which foam also contains a halogenated polymer with a dehydrohalogenating agent at a temperature and time sufficient to at least partially dehydrohalogenate the halogenated polymer;

(2) washing the foam with a suitable inert medium so as to substantially remove the dehydrohalogenating agent and

(3) drying the thus treated foam.

4,489,914

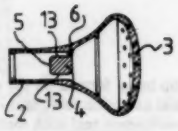
VALVE ASSEMBLY

Robert C. Stevenson, 31 Selwyn Rd.; Michael G. Enright, 23 Copperfield Ter., both of Howick, Auckland, and Bruce Nodwell, 15 Bluegum Rise, Pakuranga, Auckland, all of New Zealand

Filed Jun. 2, 1981, Ser. No. 269,728

Int. Cl.³ F16K *51/00*; B05B *15/08*

U.S. Cl. 251—147 **15 Claims**



1. A valve comprising a first inlet pipe with unobstructed bore and open at one fluid outlet end and a second outlet pipe concentrically fitted in removable sliding contact over the open fluid outlet end of said first pipe, said second pipe having a plug mounted along the central axis thereof and at least one axial passage between said plug and the inner wall of said pipe, said plug having a shape adapted to enter into the open outlet end of said first pipe and occlude the same, said first and second pipes being axially movable relative to each other between a first position wherein said plug enters into and occludes the open outlet end of said first pipe and a second position wherein said plug is free of said open outlet end.

4,489,915

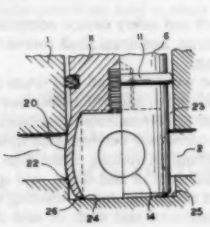
VALVE

Michael D. West, Arlington Heights, and Robert H. Dean, Evanston, both of Ill., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,527

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—161 **11 Claims**



1. A valve comprising:

a valve housing having a flow passage therein, and a cavity adapted to receive a valve plug;

a metallic valve plug disposed within said cavity, said valve plug having a thin-walled hollow cylindrical portion in alignment with said flow passage and having flow apertures therethrough, said cylindrical portion having a longitudinal axis,

said valve plug being rotatable in said cavity to place said flow apertures in fluid communication with said flow passage and being rotatable to place said flow apertures out of fluid communication with said flow passage,

said cavity having a surface adapted to engage the end of said cylindrical portion; and

means for applying pressure to said valve plug in the direction of said longitudinal axis for urging said end against said surface and to subject said wall to loading forces, said end being chamfered such that when said cylinder is subjected to loading pressures the wall of said hollow cylindrical portion is deflected into contact with the adjacent wall of said cavity.

4,489,916

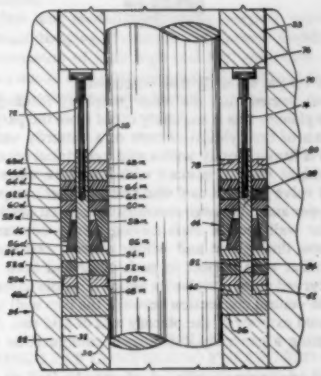
VALVE AND STEM SEAL THEREFOR

Russell E. Stevens, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Apr. 7, 1982, Ser. No. 366,367

Int. Cl.³ F16K *41/04*

U.S. Cl. 251—214 **12 Claims**



1. A valve comprising

a body having an inlet, an outlet, a valve chamber, and a valve seat surrounding communication between said inlet and said outlet,

a valve member positioned within said valve chamber,

a valve stem extending through said body and connected to said valve member,

a bonnet surrounding said valve stem,

means for moving said valve stem to move said valve member toward and away from said valve seat to control flow therethrough,

a seal ring of extrudable material positioned between said stem and said body,

rings positioned on opposite sides of said sealing ring between said valve stem and said body,

means adjacent said seal ring providing a recess opening toward the pressure side of said seal ring,

a base ring having an annular upstanding rim with inner and outer shoulders at the base of said rim,

said seal ring and said other rings forming a first stack positioned on the interior of said rim on said inner shoulder,

a second stack of a seal ring and rings similar to the rings on said inner shoulder positioned in the exterior of said rim on said outer shoulder, means adjacent said seal ring of said second stack providing a recess opening toward the pressure side of said seal ring,

means engaging said rim and said stacks independent of said body and stem for preloading said stacks of rings upon installation to obtain an initial pressure seal between said stem and said bonnet and said seal rings extruding into their respective recess to provide sealing lips in such recesses when pressure is within said bonnet to provide a

more effective seal between said stem and said bonnet when the stacks are responsive to interior bonnet pressure.

4,489,917

LOW TORQUE VALVE DISC FOR LINED BUTTERFLY VALVES

Hans D. Baumann, 32 Pine St., Rye, N.H. 03870

Filed Feb. 10, 1983, Ser. No. 452,305
Int. Cl.³ F16K 1/22
U.S. Cl. 251—305 **5 Claims**

1. A low torque butterfly disc comprising:

a. an oval shaped disc, the outer periphery forming a rim whose planary axis is angularly offset from the perpendicular axis of the cylindrical bore of a butterfly valve and which is fitting closely within said cylindrical bore, forming straight lines of contact with said bore when in the closed valve position, said disc being further composed of one upper and one lower centrally connected nearly semicircular wall section each having nearly constant wall thickness throughout and whose planary axis are angularly offset with respect to each other and both further have curved outer peripheries which interjoin to form said rim, the central connection between the two wall sections is located exterior of the planary axis of said rim, thereby generating a generally cup-shaped configuration of said disc;

b. at least one perpendicular hub section located on a common axis central to said cylindrical bore and containing within it a bore to receive a supporting valve shaft;

c. said rim having an essentially flat termination surface perpendicularly disposed to said planary axis of the oval shaped disc and further having rounded edges, one of them capable of sealingly interacting with the bore of the butterfly valve;

d. said rim further extends around the bore contained within the perpendicular hub section, said rim extension being capable of sealing interference with said butterfly valve bore, and having an outer periphery that follows a radius whose locus is displaced from the center of said hub bore.

4,489,918

NONFLOATING SEAT FOR EXPANDING GATE VALVES

Manmohan S. Kalsi, 14307 Chevy Chase, Houston, Tex. 77077

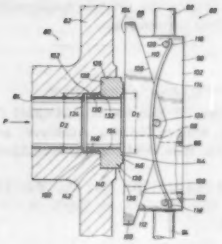
Filed Feb. 18, 1983, Ser. No. 467,889
Int. Cl.³ F16K 3/00
U.S. Cl. 251—328 **21 Claims**

1. A nonfloating seat for expanding gate valves having a valve body defining an upstream seat recess, said seat comprising:

(a) a seat ring body of rigid character for interference retention within the upstream seat recess of said valve body;

(b) a sealing face of circular form being defined by said seat ring body and being disposed for sealing engagement with the segment portion of an expanding gate and segment assembly;

(c) an axial extension tube extending from said seat ring body and having an outer periphery of small dimension as compared to the dimension of the outer periphery of said seat ring body, said seat ring body and said axial extension tube cooperatively defining a flow port in fluid registry with the flow passage of said valve body; and



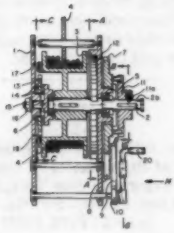
(d) a radial sealing lip being formed on the outer peripheral portion of said axial extension tube, said radial sealing lip establishing an interference seal with said valve body.

4,489,919

SAFETY WINCH WITH DISENGAGEABLE DRIVE

Meyer Ostrobrod, 6723 Castor Ave., Philadelphia, Pa. 19149

Filed Mar. 21, 1983, Ser. No. 477,347
Int. Cl.³ B66D 1/48, 1/14
U.S. Cl. 254—346 **2 Claims**



1. A combined winch and safety device comprising:

a housing having a drum and drum shaft rotatably mounted within said housing;

a rope adapted to be wound around said drum and having one end thereof secured to said drum, the other end of said rope being adapted to be connected to a worker;

spiral spring means connected between said drum and said housing so that during unwinding of the rope and therefore rotation of said shaft of said drum, said spiral spring means is tensioned and while during winding of the rope and therefore rotation of said shaft of said drum in an opposite direction, said spring means is relaxed;

centrifugal brake means within said housing for preventing rapid unwinding of said rope from said drum;

a speed changing transmission carried by said housing;

a manually operable drive member carried by said housing for driving at least one member of said transmission, and

a clutch mounted on said drum shaft for rotation therewith and being movable between a first axial position on said shaft in which it connects said drum shaft with said transmission thereby interconnecting said drum and shaft with said drive member and a second axial position on said shaft in which the clutch disconnects said drum and shaft from

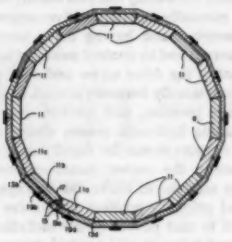
said transmission so that the rotation of said drum is not affected by said drive member but is determined by the speed of the rope being wound upon or unwound from said drum and further including means for selectively maintaining said clutch in each of said first and second positions.

4,489,920

HOT ZONE CHAMBER WALL ARRANGEMENT FOR USE IN VACUUM FURNACES

William R. Jones, 244 Hampshire Dr., Chalfont, Pa. 18914

Filed May 20, 1983, Ser. No. 496,636
Int. Cl.³ F23M 5/00
U.S. Cl. 266—283 6 Claims



1. Hot zone chamber wall arrangement for use with a vacuum furnace, which vacuum furnace has a heating means comprising in combination: a plurality of chamber wall panels of ceramic oxide material, each of said panels having a thickness dimension, a depth dimension, and a width dimension, and each panel disposed to have an inside surface defined by its depth and width dimension and each further formed to have a width dimension which is at least one and one-half times larger than its depth dimension, each of said panels formed to be bevelled along its thickness dimension, each of said panels further formed and disposed to come in contact along its depth dimension with an adjacent wall panel whereby each two adjacent wall panels in abutment form an abutment angle whose apex is on the outside of a closed plane; a plurality of overlap support panels with each disposed and formed to have an angle which fits over said abutment angle of a different pair of adjacent wall panels; metal ring means formed and disposed to fit around the periphery of said plurality of said overlap support panels; a plurality of securing means formed and fitted through said metal ring, through said overlap support panels and through said wall panels whereby said wall panels and said overlap support panels are held in place to form said hot zone chamber.

4,489,921

RESILIENT ENGINE MOUNT

Richard D. Martin, Stratford, Canada, assignor to The Standard Products Company, Cleveland, Ohio

Filed Oct. 29, 1982, Ser. No. 437,696
Int. Cl.³ F16F 15/00
U.S. Cl. 267—141.5 16 Claims

1. A mounting device for resiliently attaching a pair of separate relatively movable bodies to one another, said mounting device comprising:

a base member adapted to be secured to a first of said relatively movable bodies;

an elongated suspended member adapted to be secured to a second of said relatively movable bodies;

a generally cylindrical intermediate member disposed between and spaced from said base member and said suspended member, said intermediate member generally circumscribing at least a substantial portion of said elongated suspended member in a spaced-apart relationship therewith;

a first elastomeric support means interconnecting said base member and said intermediate member for resiliently supporting said intermediate member longitudinally, laterally and vertically relative to said base member;

a second elastomeric support means interconnecting said intermediate member and said suspended member for resilient supporting said suspended member longitudinally, laterally and verticaly relative to said intermediate member;

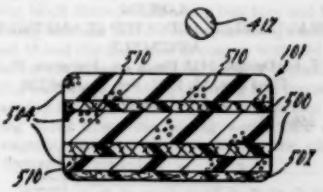
said first and second elastomeric support means having distinct damping characteristics, thereby tending to resist transmission of both high and low amplitude vibrations from one of said relatively movable bodies to the other of said relatively movable bodies.

4,489,922

SPRING LEAF COMPRISING PULTRUDED BEAM

Donald G. Fesko, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 16, 1980, Ser. No. 150,547
Int. Cl.³ F16F 1/36
U.S. Cl. 267—149 5 Claims



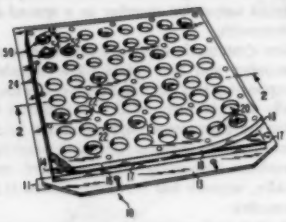
1. A vehicular spring leaf which comprises a pultruded beam that has about 40–75% by volume filamentary solids of a first modulus and a remainder fraction comprising continuous organic solid of a second, lower modulus that binds together said filamentary solids, a first portion of at least about 80% by weight of said filamentary solids being a multitude of discrete, tensilely stressed filamentary solids, densely packed substantially uniformly throughout said organic solid and coextending said beam longitudinally in a plurality of planes that accept tensile or compressive stress, respectively, upon a flexure of said leaf that bends said beam, a second portion of up to about 10% by weight of said filamentary solids being randomly oriented filamentary solids on a surface of said beam, and a third portion of up to about 10% by weight of said filamentary solid being woven filamentary solids oriented substantially across one another in one plane of said planes.

4,489,923

FIXTURE FOR SOLDER TINNING CHIP CARRIERS

Anthony J. Barresi, Hammonton; Leonard Nelson, Cherry Hill, and Jack Pogson, Toms River, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 5, 1983, Ser. No. 520,820
Int. Cl.³ B25B 11/00
U.S. Cl. 269—8 8 Claims



1. A fixture for supporting chip carriers for solder tinning, comprising:

a member having a substantially planar major surface to which solder will not adhere, said member including magnetic means for magnetically retaining chip carriers on said member while said member is in a chip-carrier-downward orientation;

said major surface having a plurality of spaced apart, physically defined chip-carrier-retention locations thereon, each adapted for retaining a single chip carriers and for spacing said single chip carrier from other chip carriers;

said member being suitable for transport across the solder wave of a wave soldering system in a chip-carrier-downward orientation with any chip carriers disposed thereon in a tinning relationship to said wave;

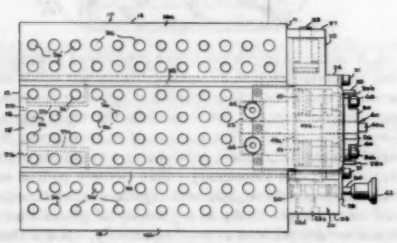
each of said chip-carrier-retention locations having a curb surface configured to contact the periphery of said single chip carrier at most at spaced points for restricting lateral movement of said chip carrier therein, for preventing contact between chip carriers and for allowing solder wave access to all edges of the chip carrier in a manner effective for tinning all contacts thereon.

4,489,924

HYDRAULICALLY ACTUATED CLAMPING TABLE ASSEMBLY

Thomas F. McDougal, 1415 Beech La., Fairmont, W. Va. 26554

Filed Jun. 14, 1983, Ser. No. 504,224
Int. Cl.³ B23Q 3/08
U.S. Cl. 269—23 15 Claims



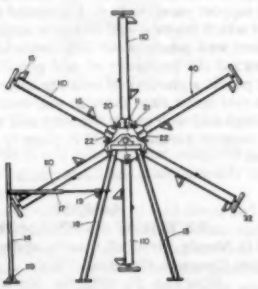
1. A quick-set hydraulic work holding clamping table assembly, comprising an elongated stationary rigid base member having a fore-and-aft longitudinal center axis and an upwardly facing top surface to be disposed in a common horizontal plane and including a front control portion at the front end of said base member and an elongated, upwardly opening dovetail cross-section slide channel opening though said top surface and extending from said front control portion to the rear end of the base member, the portions of said top surface laterally flanking said slide channel forming a pair of transversely spaced flat lateral platen sections, an elongated slide plate member having a dovetail cross-section shaped and sized to slidably interfit in said slide channel and extending substantially the length thereof having its top surface lying in the same common plane as the top surface of the said lateral platen sections and forming a movable center platen section, said platen sections each having upwardly opening apertures therein some of which are threaded for variably fixing jaw pieces thereon for holding workpieces of various shapes on the top surfaces of the platen sections, means supporting said slide plate member for longitudinal movement forwardly and rearwardly of the base member including a manually operable drive screw coupled to said slide plate member and having drive screw support means connected thereto and to control means in said control portion for movement of the drive screw and slide plate member forwardly and rearwardly between a work gripping position and a work release position, said control means in said control portion including hydraulic power means connected to said drive screw support means for rapidly moving said slide plate member forming the center platen section relative to said lateral platen sections to move the workpiece engaging jaw pieces to said gripping position responsive to application of fluid pressure to said power means including a manually adjustable control valve in said control means, and said control valve and control means including means for returning said slide plate member forming the center platen section to a release position relative to the lateral stationary platen sections.

4,489,925

EQUALIZER CLAMP

John L. Mortoly, Poughkeepsie, N.Y., assignor to James L. Taylor Mfg. Co., Poughkeepsie, N.Y.

Filed Sep. 4, 1981, Ser. No. 299,341
Int. Cl.³ B23Q 1/04
U.S. Cl. 269—71 14 Claims



1. A device for holding in position articles to be joined said device comprising:

a frame;

a clamp member;

said clamp member comprising a clamp carrier having a carrier a longitudinal axis and a pair of jaws thereon between which the articles to be joined are clamped;

means for connecting said clamp carrier to said frame, said means comprising a pair of plate members connected to said frame and mounted on opposite sides of said clamp carrier for relative movement between the carrier and plates whereby said carrier is axially moveable in relation to its axis relative to said frame; and

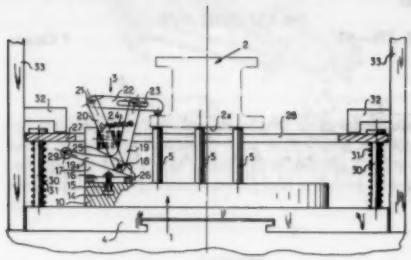
locking means for fixedly positioning the clamp carrier relative to the plate members.

4,489,926

WORKPIECE SUPPORTING AND CLAMPING UNIVERSAL DEVICE

Jean-Pierre Blatrix, Colombes, France, assignor to Automatique Industrielle S.A., France

Filed Sep. 8, 1982, Ser. No. 415,972
Claims priority, application France, Sep. 14, 1981, 81 17334
Int. Cl.³ B23Q *3/02*
U.S. Cl. 269—93 **8 Claims**



1. A universal device for temporary supporting and clamping of a workpiece of any type, comprising:

a base plate;

a plurality of discs inserted into one another and relatively movable in rotation on said base plate, said plurality of discs comprising, from outwardly to inwardly thereof, a first disc, a second disc, and a third disc concentrically arranged with respect to one another to rotate about a common center of rotation, and a fourth disc eccentrically arranged within said third disc;

a column mounted on each of said respective first, second, and fourth discs, said column mounted on said fourth disc passing through said column center of rotation of said other three discs upon rotation of said fourth disc, so that said three columns carried by said respective first, second and fourth discs are capable of covering all points of any given surface of the workpiece; and

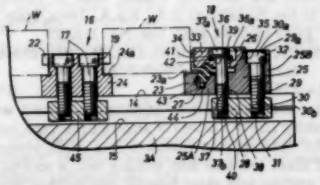
means for clamping and unclamping the workpiece supported by said columns.

4,489,927

SLIDE WEDGE CLAMP

Sohei Yamada, and Ichiro Miyata, both of Itamishi, Japan, assignors to Aioi Seiki Kabushiki Kaisha, Japan

Filed Sep. 24, 1982, Ser. No. 422,846
Claims priority, application Japan, Feb. 19, 1982, 57-23042[U]
Int. Cl.³ B23Q *3/02*
U.S. Cl. 269—137 **6 Claims**



1. A slide wedge clamp for engagement with a mounting plate having a T-sectioned groove member, a clamping block, a fixing bolt, a clamping bolt, a T-nut-shaped fixing means and a raised workpiece-carrying portion; wherein

said work-engaging member has a forward end and a rearward end, a forward and upward faced driving wedge face located between said forward end and said rearward end, a stepped-down portion forward of said face, a stepped-up portion rearward of said face, an underside portion constituting a seating face arranged to be seated on a mounting face in a mounting plate, a fixing bolt bore in the rear stepped-up portion perpendicular to the seating face; the upper portion of the peripheral wall of the fixing bolt bore being stepped outward from the lower portion of the peripheral wall of the fixing bolt bore to constitute a bolt head receiving face;

a T-nut-shaped fixing means for engagement with a T-shaped groove in a mounting plate, said T-nut-shaped fixing means having a threaded bore for engagement with said fixing bolt and a threaded bore for engagement with said clamping bolt;

said fixing bolt being arranged to be set from above said work engaging member through said fixing bolt bore into said threaded bore for engagement with said fixing bolt provided in said T-nut-shaped fixing means; the head of said fixing bolt being arranged to be in contact with the bolt head receiving face so that the work engaging member is securable to a mounting plate; said raised workpiece-carrying portion being located on the forward end side of the work-engaging member and being an integral part of the work-engaging member; the topside of the workpiece-carrying portion constituting a workpiece-carrying surface; said workpiece-carrying surface being higher than said seating face;

said clamping block having a forward end face constituting a clamping face, a rear end face constituting a rearward and downward faced driven wedge face, a vertical clamp bolt bore having a diameter which allows play between said clamping bolt and said clamp bolt bore when said clamping bolt is placed in said clamp bolt bore, the upper portion of the peripheral wall of the clamp bolt bore being stepped outward from the lower portion of the peripheral wall of the clamp bolt bore to provide a fastening face; said clamping block being disposed above the stepped-down portion of the work-engaging member and forward of said driving wedge face; said clamping face being retracted rearward of said raised workpiece-carrying portion, said driven wedge face being in contact with said driving wedge face;

said clamping bolt being arranged to be set from above said clamping block through said clamp bolt bore and beyond said seating face into said T-nut-shaped fixing means, with the head of said clamping bolt in contact with said fastening face so that when a fastening force is applied to the clamping bolt, the head of the clamping bolt forces down the clamping block to slide the driven wedge face of said clan.ping block down the driving wedge face of said work-engaging member thereby driving the clamping block forward for clamping.

4,489,928

VISE HAVING ADJUSTABLE FEATURES

Otto E. Dietrich, 617 W. Jackson St., Morton, Ill. 61550

Filed Sep. 16, 1982, Ser. No. 418,683
Int. Cl.³ B23Q *3/02*
U.S. Cl. 269—251 **1 Claim**

1. A clamping apparatus comprising:

a base including a pair of tracks having grooves formed therein;

a first jaw connected to said base;

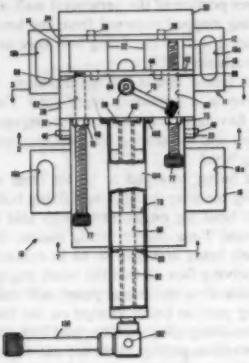
a second jaw movably connected to said base;

means connected to said second jaw for moving said second jaw toward and away from said first jaw;

means interconnecting said second jaw and said base for guiding movement of said second jaw, said interconnecting means being removably connected with said second jaw and extending into ones of said grooves;

a pair of adjustable members carried by said second jaw and extendible therefrom toward said first jaw, said adjustable members each being independently adjustable relative to each other and relative to said second jaw;

means for securing said adjustable members in position relative to said second jaw;



means for securing said second jaw to said base, said means being carried by said second jaw and including a handle and a threaded member in said second jaw engaged with a plate slidably mounted with others of said grooves;

a plurality of opposed wear take-up members connected to said second jaw and engaging said tracks; and

a cover plate removably connected to said movable jaw.

4,489,929

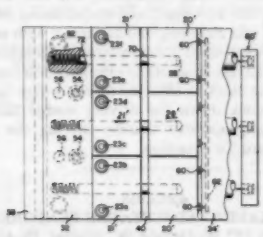
MODULAR CLAMPING SYSTEM

Wolf J. Blechschmidt, 16421 Northeast 18th St., Bellevue, Wash. 98008

Filed Aug. 30, 1982, Ser. No. 412,909

Int. Cl.³ B25B *1/24*

U.S. Cl. 269—282 **8 Claims**



1. A soft jaw system comprising:

vice means having a planar slide face and opposing fixed and movable vice jaws at opposite sides of the slide face;

soft removable jaw block means resting flat on said slide face and comprising a stationary jaw block opposed by said fixed vice jaw and a slide jaw block between said fixed jaw block and movable vice jaw to be engaged by the latter;

alignment pin means parallel to said slide face and interfitting with said fixed vice jaw, stationary jaw block and slide jaw block, said alignment pin means comprising a pin projecting from said slide jaw block and slidably passing through said stationary jaw block into said fixed vice jaw;

spring means in said fixed vice jaw for yieldingly urging said pin away from said fixed vice jaw; and

detachable hold-down means clamping said stationary jaw block against said slide surface.

4,489,930

APPARATUS FOR COLLECTING FOLDED PRINTED SHEETS

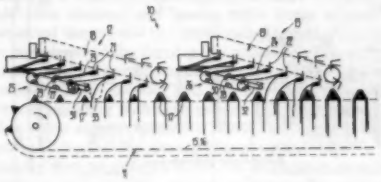
Jacques Meier, Büretswil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed May 23, 1983, Ser. No. 497,140

Claims priority, application Switzerland, Jun. 1, 1982, 3350/82

Int. Cl.³ B65H *5/30*

U.S. Cl. 270—55 **7 Claims**



1. An apparatus for collecting folded printed sheets, comprising:

an endless revolving collecting conveyor defining a predetermined conveying direction and serving to take-up each printed sheet in a straddling configuration;

a number of infeed means arranged along said collecting conveyor for infeeding the printed sheets thereto;

each said infeed means comprising an endless revolving traction means equipped with controlled gripper units mounted thereat in spaced relationship from each other;

each said gripper unit being structured to grip one of said printed sheets at a fold region thereof;

each said infeed means containing a delivery region cooperating with said collecting conveyor;

at least said delivery region of said infeed means extending substantially in the same direction as said predetermined conveying direction of said collecting conveyor;

said collecting conveyor comprising a number of receiving saddles for receiving said printed sheets;

said receiving saddles being arranged in spaced relationship from one another and extending transversely with respect to said predetermined conveying direction; and

an opening device associated with said delivery region of each infeed means and acting upon said folded printed sheets in order to open the same.

4,489,931

DEVICE FOR AUTOMATICALLY POSITIONING A SHEET ON A PLATEN OF AN OFFICE MACHINE

Armando Costa, and Giovanni Verani, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Oct. 20, 1981, Ser. No. 313,303

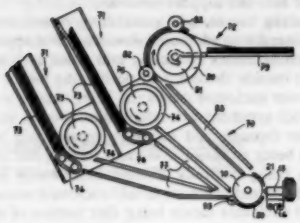
Claims priority, application Italy, Oct. 24, 1980, 68630 A/80

Int. Cl.³ B65H *29/06, 5/12, 5/14*

U.S. Cl. 271—277 **2 Claims**

1. A device for automatically positioning a sheet with respect to a writing line of a platen of an office machine, comprising means for rotating said platen, a first guide element for guiding said sheet towards said writing line, a second guide element for guiding said sheet beyond said writing line, electromagnet means for coupling said first guide element to said platen in such manner that said first guide element rotates together with said platen when said platen rotates, and control means for controlling said rotating means and the energization of said electromagnet means to drive said sheet beyond said

writing line by a predetermined amount until said sheet is brought into cooperation with said second guide element, wherein said electromagnet means comprises a substantially cylindrical core rotably mounted with respect to said platen



and moulded to define a couple of pole shoes coaxial therebetween, an armature angularly fixed with respect to said platen and opposed to said pole shoes, and an exciting coil for generating a magnetic flux for coupling said armature to said pole shoes.

4,489,932

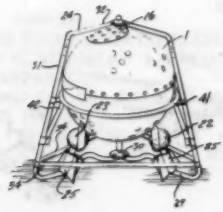
AMUSEMENT DEVICE

Gary L. Young, 3405 Sinton Rd. #199, Colorado Springs, Colo. 80907

Filed Oct. 22, 1982, Ser. No. 435,944

Int. Cl.³ A63G *1/12*

U.S. Cl. 272—36 **5 Claims**



1. An amusement device comprising:

a generally spherically shaped hollow shell structure having an interior sufficiently large to accommodate a human being including hatch means to permit ingress and egress from the interior of the shell structure;

a frame having an equilateral triangular ground plan base with upstanding leg portions from the apex of each base angle which converge to a common connection over the shell structure;

inverted castor means carried by the base frame at each of the three apexes thereof which castor means rotatably support the said shell structure for free rotation about the three mutually perpendicular axes of the shell.

4,489,933

EXERCISE DEVICE

Milton W. Fisher, 306 W. Farmer, Independence, Mo. 64055, and Glen E. Henson, Independence, Mo., assignors to Milton W. Fisher, Independence, Mo.

Continuation-in-part of Ser. No. 406,290, Aug. 9, 1981, abandoned. This application Nov. 2, 1983, Ser. No. 548,213

Int. Cl.³ A63B *23/00, 21/00*

U.S. Cl. 272—65 **6 Claims**

1. An exercise device for a person comprising:

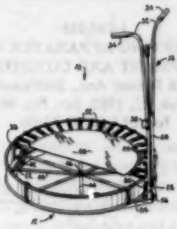
a circular base having a sidewall and a rim extending around the top edge of said sidewall,

said sidewall being relatively lightweight and incapable of supporting a person,

said rim being rigid with said sidewall and providing sufficient reinforcement whereby in combination with the sidewall a person may be supported;

a circular member having a sidewall and a rim extending around the top edge of said sidewall,

said member sidewall being relatively lightweight and incapable of supporting a person,



said member rim being rigid with said member sidewall and providing sufficient reinforcement whereby in combination with the sidewall a person may be supported;

roller means coupled with said circular member and depending therefrom for engagement with said base rim;

a plurality of cross braces extending from each of said base and said member, said cross braces converging on a point and being coupled together at said point to accommodate rotational movement of said member relative to said base; and

resilient flexible sheet means coupled with said member rim and extending across the latter whereby to support said person exercising.

4,489,934

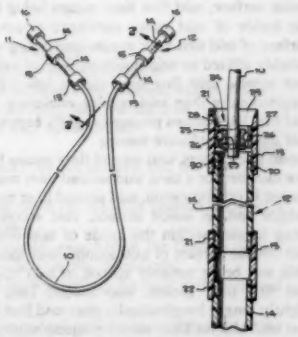
JUMPING ROPE

Robert A. Miller, 19330 Sagebrush Trail, Desert Hot Springs, Calif. 92240

Filed May 9, 1980, Ser. No. 148,244

Int. Cl.³ A63B *5/20*

U.S. Cl. 472—75 **4 Claims**



1. A jump rope construction comprising:

(a) a terminal coupling comprising a cylindrical, hollow member having a first and second end, the inner surface of the first end of said terminal coupling being tapered outwardly to form a constantly increasing diameter at the first end thereof;

(b) a plurality of extension members joined by intermediate couplings, said extension members being axially joined to the second end of said terminal coupling whereby the distance between the terminal coupling and the opposite extension member is adjustably increased; and

(c) a ball bearing assembly secured within the hollow interior of the terminal coupling substantially adjacent the first end of said terminal coupling, the ball bearing assembly including ball bearings, a race and a ball bearing housing secured to the interior surface of said terminal coupling, said ball bearing assembly defining an opening at its center for attachment of the rope therethrough.

4,489,935

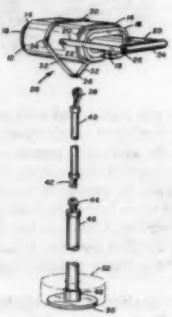
WEIGHT LIFTING APPARATUS FOR ARM DEVELOPMENT AND CONDITIONING

Jewell D. Lusk, 3516 Roland Ave., Baltimore, Md. 21211

Filed Feb. 22, 1983, Ser. No. 468,049

Int. Cl.³ A63B *21/06*

U.S. Cl. 272—117 **10 Claims**



1. An apparatus, comprising:

an outer enclosure means, said outer enclosure means being a housing member, said outer enclosure means being "C" shaped in configuration, said "C" shaped configuration being cuff-like, said outer enclosure means having an outside surface and an inside surface;

a first liner means, said first liner means being a protective member, said first liner means being "C" shaped in configuration, said first liner means having an outside and an inside surface, said first liner means being located within the inside of said outer enclosure means, said outside surface of said first liner means interfacing with and being suitably affixed to said inside surface of said outer enclosure means, said first liner means being slightly longer longitudinally than said outside enclosure means so that said first liner means projects slightly beyond the edges of said outside enclosure means;

a second liner means, said second liner means being a protective member for a user, said second liner means being "C" shaped in configuration, said second liner means having an outside and an inside surface, said second liner means being located within the inside of said first liner means, said outside surface of said second liner means interfacing with and being suitably affixed to said inside surface of said first liner means, said second liner means being slightly longer longitudinally than said first liner means so that said second liner means projects slightly beyond the edges of said first enclosure means;

a support means, said support means providing support for an additional element of said apparatus, said support means being a pair of arm-like members, said arm-like members each having a first end and a second end, one of said pair of arm-like members being located on each of the opposite sides of said outer enclosure means, each said arm-like member being pivotally affixed by suitable means at said first end thereof to said outer enclosure means;

a hand grip means, said hand grip means being for gripping by a user, said hand grip means being cylindrical and rod-like, said hand grip means being located and pivotally affixed by suitable means between said second ends of said pair of arm-like support members;

a positioning means, said positioning means serving as a positioner for an additional element of said apparatus, said positioning means encircling said outer enclosure means on the outside thereof, said positioning means encircling said outer enclosure means and being shaped in a non-circular but symmetrical configuration about a vertical center line through said enclosure means, said positioning means being rectangular in cross section, said positioning means being centrally located transversely across and suitably affixed to the top of said enclosure means, said top of said enclosure means being that portion of said enclosure means that is uppermost when the open portion of said "C" shaped configuration is located downwardly said positioning means being spaced from said open portion of said "C" shaped configuration;

a weight means, said weight means providing a variation in the weight of said apparatus; and

a connecting means, said connecting means serving as a connecting member, said connecting means connecting said weight means to said positioning means.

4,489,936

GYMNASTIC IMPLEMENT

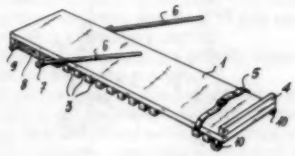
Antonio Dal Monte, Piazza Apollodoro 26, Rome, Italy 00196

Filed Jan. 5, 1983, Ser. No. 455,853

Claims priority, application Italy, Jan. 8, 1982, 47523 A/82

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—120 **13 Claims**



1. In gymnastic apparatus for body training through user manipulation, a body support platform and a platform supporting and manipulating frame, said frame including first frame means for support and manipulation of said platform and second frame means for support and manipulation of said platform in cooperation with said first frame means, an intermediate portion between and interconnecting said first and second frame means, said first frame means including first platform engageable means for engaging said platform, said intermediate portion including second platform engageable means for engaging said platform, and mounting means on said support platform for selectively receiving said first and second platform engageable means to vary the manipulative relationship between the frame and platform, each of said platform engageable means selectively defining a fulcrum for pivotal manipulation of said frame and said platform upon physical engagement with and manipulation of said second frame means.

4,489,937

SAFETY DYNA-BENDER

Cathay G. T. Kong, 181, Min-Tsu Rd., Ping-Tung City, Taiwan

Filed Aug. 13, 1982, Ser. No. 407,745

Int. Cl.³ A63B *21/02*

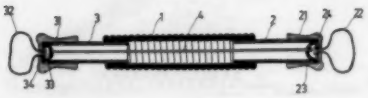
U.S. Cl. 272—137 **1 Claim**

1. A safety dyna-bender having a steel spring coil, a pair of

metal handle pipes repsectively connected at both ends of the steel spring coil defining a hollow section therein, a pair of hollow hand grips separately coupled with the outer end portions of the handle pipes, and a wrist ring provided at each end of the hand grips, which comprises:

a flexible cord movably installed in the hollow section defined by the steel spring coil and the handle pipes and

positioning means respectively disposed at each end of the handle pipes for movably anchoring and restraining said flexible cord so that protection against any unexpected



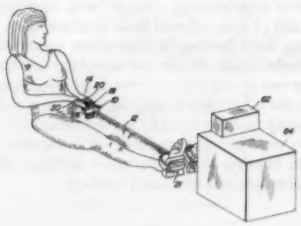
accidents resulting from either the breaking of the steel spring coil or the sudden loosening of the handle pipe thereof can be effected therewith, said positioning means comprises a pair of cup shaped positioning anchors each having a flange collar integrally formed along the edge thereof for being extrudingly secured along the open edge of the handle pipes, and a central aperture formed through the middle thereof for movably anchoring said flexible cable and restraining the retraction of the wrist rings thereof.

4,489,938

VIDEO COMPUTER SYSTEM CONTROLLED BY OPERATION OF ELASTOMERIC EXERCISE APPARATUS

Kazimir R. Darzinskis, 3533 East Ave., Berwyn, Ill. 60402

Filed Jun. 20, 1983, Ser. No. 506,016
Int. Cl.[3] A63B *21/02*
U.S. Cl. 272—142 **10 Claims**



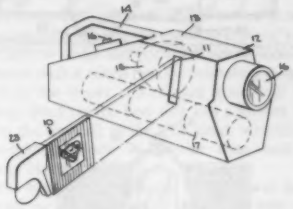
1. The combination with an elastomeric stretching exercise apparatus of a joystick operated switch mechanism for operating a video game computer for the play of a video game, the said exercise apparatus comprising an elastic stretching member connected at one end to a handlebar and being suitably anchored at its opposite end to be stretchable to more than its relaxed length by manual pulling from the handlebar, a transducer body with which the handlebar is mounted in spaced relation and through which the stretching exercise member is connected, and switch means in said transducer body arranged for operation solely by the stretching action of the said stretching member as it is pulled from said handlebar, the last named switch means being connected to the computer to effect the "fire" operation of the joystick mechanism.

4,489,939

MANIPULATING PLAY ELEMENTS IN LIQUID CELL

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Apr. 11, 1980, Ser. No. 139,341
Int. Cl.[3] A63F *7/00, 9/14*; A63H *23/08*
U.S. Cl. 273—1 L **3 Claims**



1. A play cartridge in combination with a conventional optical projector or viewer having a slot normally intended to receive a slide, said cartridge being insertable into the slot to provide images on a screen which are manipulatable by the player, said projector including a light source and a projecting lens which produces an inverted image of the cartridge interposed between the source and lens, said cartridge comprising:

A. a liquid-filled cell formed of transparent material and having parallel front and rear walls through which light from said source is transmitted, said cell being mounted within a rectangular frame;

B. opaque play elements disposed in said cell formed by objects whose specific gravity is less than that of the liquid whereby the objects normally rise to the top of the cell; and

C. an external actuator supported on the frame and operable by a player to animate said play elements by propelling them toward the bottom of the cell, the play activity being viewable on said screen, where the objects, because of the inversion, appear to be moving upon actuation from the bottom to the top of the cell, and

D. fixed targets disposed in said cell to capture said propelled play elements.

4,489,940

PRACTICE GOALTENDER

Arthur G. Amundson, 4515 Oneida St., Duluth, Minn. 55804

Filed Sep. 29, 1982, Ser. No. 428,154
Int. Cl.[3] A63B *69/00*
U.S. Cl. 273—1 B **2 Claims**

1. A practice goaltender for ice hockey and the like, comprising

(a) a vertically aligned sheet cut into the general shape of a goaltender silhouette;

(b) a base member hingedly attached at the bottom of said sheet and extending rearwardly therefrom;

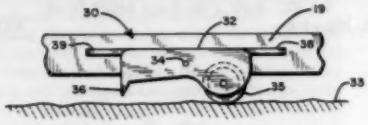
(c) a resilient material layer covering the front surface of said sheet;

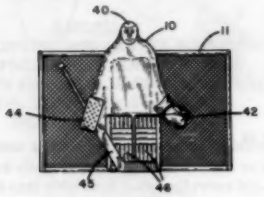
(d) an outer covering over said resilient layer, attached along the rear surface of said sheet and at least partially compressing said resilient material layer; and

(e) at least one support brace extending proximate the rear top of said sheet to proximate the rear of said base member;

(f) a pivotal assembly attached to said base member, said assembly including a wheel member and a pointed mem-

ber, and means for pivoting to engage either member with the ground or ice; and





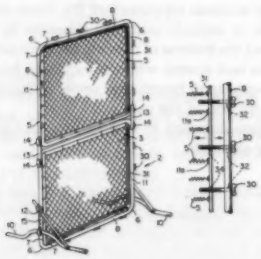
(g) a base bumper attached to said sheet across the bottom front surface of said outer covering.

4,489,941

SPORTS NET APPARATUS

Shin-Shi Shieh, 56-3, Kien Kwo N. Rd., Taipei, Taiwan

Filed Sep. 21, 1982, Ser. No. 420,661
Int. Cl.³ A63B *69/00*
U.S. Cl. 273—26 A **4 Claims**



1. A movable webwork support for the training and sporting of ball games, comprising a framework surrounded by a tube formation for protection, the interior of said framework comprising a webwork edged with adjustment rods, said tube formation and said webworks being integrated by a number of ring-hooked spring retainers, means connecting said adjustment rods to the edges of said web work and adjusting screws for adjusting the tension of said webwork by displacing said adjustment rods, said adjusting screws extending between said tube formation and said adjustment rods.

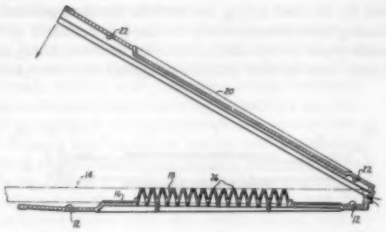
4,489,942

TENNIS RACKET AND STRING ALIGNER THEREFOR

Willie D. Kent, 280 S. Euclid, #319, Pasadena, Calif. 91101

Filed Sep. 29, 1982, Ser. No. 427,469
Int. Cl.³ A63B *49/00*
U.S. Cl. 273—73 R **6 Claims**

1. In combination: a racquet for playing a racquet game, which racquet includes a frame that supports strings as a grid with apertures formed between intersecting strings so as to form an array; and a device for aligning said strings in said frame, said device comprising a base, a plurality of posts rising from said base, and arranged in a pattern to conform to at least a part of said array, each said post being so shaped and so disposed and arranged as to contact at least two strings which bound the aperture into which it enters, and a cover adapted to



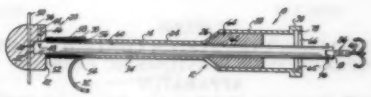
fit against said base and sandwich said frame between them, said posts thereby aligning the strings contacted by them, and said base and cover enclosing said frame, but enabling removal of the frame from between them.

4,489,943

PERSONAL PROTECTION DEVICE

August R. Werft, Venice, Fla., assignor to Allan J. Werft, Chagrin Falls, Ohio, a part interest

Filed Jan. 13, 1983, Ser. No. 457,758
Int. Cl.³ F41B *15/06*
U.S. Cl. 273—84 R **11 Claims**



1. A hand-held non-lethal personal defense and fishing device comprising an elongated housing, an axial longitudinal bore extending through at least a portion of said housing, a slidably reciprocable rod axially disposed in said axial longitudinal bore of said housing, a single hook member projecting from one end of said rod, said hook member being in the form of a fishing hook having at least three substantially evenly disposed barbs, means for directly attaching said hook member to said one end of said rod, and rod displacing means provided proximate the other end of said rod, wherein actuation of said rod displacing means longitudinally displaces said rod from an inoperative position whereby said hook member is disposed within said housing to an inoperative position whereby said hook member projects from said housing.

4,489,944

MANIPULATIVE EGG-SHAPED PUZZLE

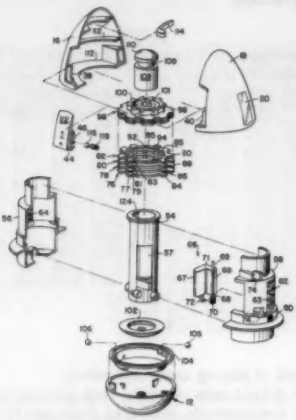
Morichika Hatakeyama, and Koichi Minami, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Sep. 9, 1983, Ser. No. 530,711
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—154 **7 Claims**

1. An amusement device, comprising:
(a) a first housing defining an area;
(b) a curved second housing defining an area and being rotatably connected to the first housing;
(c) a first movable means having a plurlity of rotatable members located within the areas defined by the first and second housings for rotatably connecting the first and second housings, the first means having a weight normally positioned in the area defined by the first housing and

being movable along a substantially straight line into the area defined by the second housing, and

(d) a second movable means operatively connected to the first movable means for allowing selective rotation of each of the plurality of rotating members,



wherein, when the second housing is rotated relative to the first housing, at least one of the plurality or rotatable members of the first movable means rotates and the weight is caused to move into the area of the second housing.

4,489,945

ALL-METALLIC GOLF CLUB HEAD

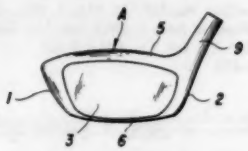
Masashi Kobayashi, Matsudo, Japan, assignor to Muruman Golf Kabushiki Kaisha, Tokyo, Japan

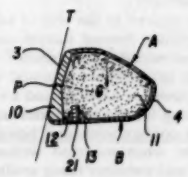
Filed Mar. 12, 1982, Ser. No. 357,681

Claims priority, application Japan, Aug. 4, 1981, 56-100004[U]

Int. Cl.³ A63B 53/04

U.S. Cl. 273—167 H **12 Claims**





1. An all-metallic golf club head comprising a hollow body formed of cast metal and ;including a front wall providing a generally flat impact face of the club head, a top wall defining a generally round upper side of the clup head, a rear wall defining a back of the club head, a bottom wall providing the edge of a cutout through which said hollow body opens downwards and a hosel extending integrally from said top wall at the heel side of the club head, a lower part of said hosel extending downwardly into said hollow body toward said bottom wall, wherein said front wall the lower half of which increases its thickness toward said edge of said cutout, and the heel end of said lower half of said front wall lies under said lower part of said hosel, and

a sole plate formed of cast metal and attached in said cutout in close conformity with the configuration of said cutout of said hollow body and provided on its inner, forward side thereof with a raised portion extending longitudinally adjacent to the lower end of said front wall to form a weighting block on the heel side and a further weighting block on the toe side of the club head, wherein said toe-side weighting block is heavier than said heel-side weighting block

wherein the increase in thickness of the lower half of said front wall moves a center of gravity of said club head towards the front wall and the bottom wall,

the raised portion of the sole plate also moves the center of gravity towards the front wall and the bottom wall,

a balance of weight between the toe side weighting block and the heel side weighting block moves the center of gravity to be approximately midway between the toe and the heel of the club head,

the extension of the lower part of the hosel into the hollow body moves the center of gravity towards the bottom wall,

whereby a sweet spot of the club coincides with the center of the front face of the club head.

4,489,946

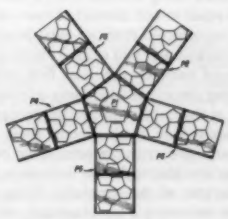
BOARD GAME HAVING CONSISTENT SHAPE RELATIONSHIP AMONG ITS PARTS

Angel A. Ortiz Burgos, A-2-11 Sequoya St., Park Gardens, Rio Piedras, P.R. 00926

Filed Sep. 30, 1982, Ser. No. 428,487

Int. Cl.³ A63F 3/00

U.S. Cl. 273—249 **10 Claims**



1. A game comprising a playing board, playing pieces, a pair of dice, and a cover for the board, wherein: the playing board comprises a central section having a plane geometrical shape, an elongated rectangular planar playing surface extending outwardly from each side of said geometrical central section, each playing surface having a plurality of playing spaces arranged on said playing surface in a single torturous path extending from the distal edge of the playing surface radially to the central section which constitutes a goal, said playing spaces having the same geometrical shape as the central section and being uncolored, each playing surface being of a different color; said playing pieces being identical in shape to the shape of the geometrical central section, said dice comprising a pair of polyhedrons, each polyhedron having a plurality of facets of the identical geometrical shape as the central section, one die having indicia on each facet to indicate the number of playing spaces a playing piece may be moved, the indicia being in the range of from one to the number of sides of the geometrical shape of the central section of the playing board and at least

two facets having instructions for rolling the dice, the other die having the same number of facets as the one die, each facet being one of the colors of the playing surfaces, at least two of the facets having instructions penalizing the player; said cover comprising a solid geometrical form identical to the geometrical shape of the central section and open on one side in order to serve as a cup for throwing said dice.

4,489,947

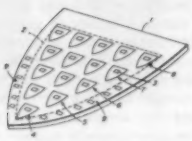
BOARD GAME

Richard H. Nolan, 7 Lawrence Rd., Weston, Mass. 02193

Continuation-in-part of Ser. No. 119,035, Feb. 6, 1980, abandoned. This application Jul. 13, 1983, Ser. No. 513,341

Int. Cl.³ A63F 3/00

U.S. Cl. 273—271 **6 Claims**



1. A plurality of game boards, each having (a) non-ordered storage sockets for storage and (b) ordered sockets, said ordered sockets being arranged in a number of rows, the number of sockets in the first row being one, and the number of sockets in each succeeding row being one more than that in the preceding row, each game board being adapted to have an owner associated therewith, a multiplicity of playing pieces adapted to fit in said sockets, each playing piece having a first non-valued characteristic and a second non-valued characteristic, such characteristics being selected from a class having a number of members equal to said number of rows, each said playing piece being so constructed that one side thereof exhibits both said first characteristic and said second characteristic while the other side thereof exhibits only said first characteristic, the number of playing pieces exhibiting any one first characteristic being the same as the number of playing pieces exhibiting any other first characteristic (and, among those playing pieces exhibiting the same first characteristic, about one half having a second characteristic identical to its first characteristic, and the second characteristic of the remainder being equally distributed among the remaining characteristics), means for repeatedly selecting a first characteristic at random in such a manner that the consequence of each such selection is only (a) the addition of a playing piece having the selected first characteristic to the selector's storage and then (b) the transfer at the option of the selector, of one or more playing pieces having the same second characteristic from the selector's storage to one row of the selector's ordered sockets, and a tabulator including means for recording only the owner and number of all ordered sockets containing a playing piece each time all the sockets in any one game board contain a playing piece, said owner being herein referred to as a "joust-winner" and being entitled to a premium, means for adding said number of ordered sockets to the accumulated number of filled sockets for that game board, means for identifying the joust-winner's premium and adding it to the accumulated number of filled sockets for the game board owned by the joust-winner, means for identifying a goal score and means for indicating when the total accumulated number of filled sockets for any of said game boards equals or exceeds said goal score and for indicating the owner of that game board.

4,489,948

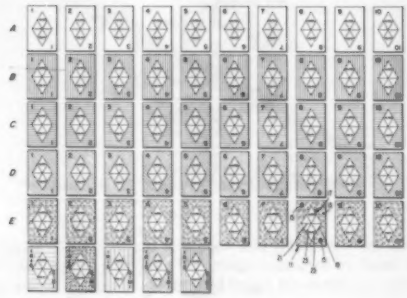
COLOR CARD PACK

A. Lynn Keyser, 419 W. 10th Ave., Huntington, W. Va. 25701

Filed Nov. 28, 1983, Ser. No. 555,813

Int. Cl.³ A63F 1/00

U.S. Cl. 273—306 **2 Claims**



1. A deck of playing cards comprising

(a) five distinct suits of cards, each said suit including ten cards consecutively numbered from one to ten with all cards having the same face design; and

(b) at least three additional cards, each said additional card being un-numbered and including identifying wording thereon distinguishing from said suits while also having said same face design;

(c) each of said suits being of a color distinct from the colors of each of the other suits;

(d) each of said additional cards being of a color different from the color of any other additional card and different from the colors of said five suits; and

(e) each said additional card comprising a unique entity not included in any suit and not comprising a suit.

4,489,949

FEATHERLESS ARROW

Donald M. Taylor, 2691 Ravenna Rd., and Thomas H. Whittaker, 2233 Ravenna Rd., both of Hudson, Ohio 44236

Continuation of Ser. No. 354,721, Mar. 4, 1982, abandoned. This application Nov. 3, 1983, Ser. No. 548,442

Int. Cl.³ F41B 5/02

U.S. Cl. 273—423 **10 Claims**

1. An arrow, comprising:

an arrow shaft having an elongated longitudinally extending hollow rear section;

a tapered nock secured to the rear of said arrow shaft and having an aperture formed therein communicating with the hollow rear section of the shaft;

an aerodynamic tail movably mounted within said hollow rear section having a stabilizer and a retainer portion;

the stabilizer being formed of a flexible material and having an elongated configuration and being aligned with the nock aperture when mounted within the hollow rear section, with said stabilizer being smaller in the transverse direction than the nock aperture to permit said stabilizer to pass through said aperture upon launching of the arrow; and

the retainer portion having a tapered head slidably movable within the hollow rear section of the arrow shaft providing slidable movement of said head along the length of said hollow section, with said head being larger in the

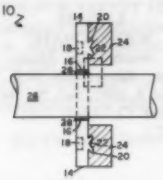
transverse direction than the nock aperture and stabilizer so as to remain within the hollow rear section of the shaft after the stabilizer passes through the nock aperture upon launching of the arrow, and with the tapered head matingly engaging the tapered nock.

4,489,950

FERROFLUID-POLE-PIECE-MAGNET APPARATUS

Alvan F. Chorney, Sharon, Mass., assignor to Ferrofluidics Corporation, Nashua, N.H.

Filed May 25, 1983, Ser. No. 497,856
Int. Cl.³ F16J *15/40*
U.S. Cl. 277—80 **10 Claims**



1. A pole piece-magnetic apparatus for use in a ferrofluid seal apparatus which apparatus comprises:

(a) a washer-like pole piece element composed of a magnetic permeable metal material having a defined inner and outer diameter and characterized by one surface having a plurality of spaced-apart indentations therein, and on the opposite surface a plurality of corresponding swaged raised dimple elements with an outwardly extending surface as an anchoring means; and

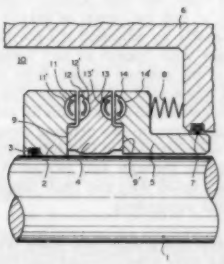
(b) a permanent magnet washer-like ring element composed of a hard molded magnetic polymer material and having an inner diameter greater than the inner diameter of the pole piece element, the permanent magnet element directly secured to the opposite surface of the pole piece by molded polymer about the anchoring means on the pole piece.

4,489,951

MECHANICAL SEAL

Tadashi Kataoka, and Hirokuni Hiyama, both of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Aug. 17, 1983, Ser. No. 523,944
Int. Cl.³ F16J *15/36*
U.S. Cl. 277—83 **6 Claims**



1. A mechanical seal comprising:

a seal housing;

a rotary ring securely mounted on a shaft within said housing for rotation with said shaft which extends through said housing;

an intermediate floating ring disposed around said shaft within said housing and adjacent to said rotary ring so that said intermediate ring rotates freely and independently of said shaft; and

a seat sleeve sealingly and unrotatably mounted in said housing and around said shaft and biased against said intermediate floating ring at the axially end surface thereof so that pressure is imposed on each of the sliding interfaces between the rotary ring and the intermediate floating ring and between the intermediate floating ring and said end surface of said sleeve;

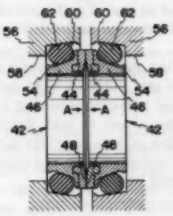
said mechanical seal being characterized in that, each of the opposing surfaces of the rotary, the intermediate floating ring and the axially end surface of the seat sleeve are slightly spaced from each other and are radially outward of the sliding interfaces, and each of the opposing surfaces is provided with annular grooves containing a plurality of blades disposed therein as a cascade of blades so that each pair of cascades of blades on the opposing surfaces form a fluid coupling.

4,489,952

MECHANICAL SEAL

Junji Ohtsuka, Ohsato, Japan, assignor to Eagle Industry Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 235,382
Claims priority, application Japan, Feb. 29, 1980, 55-24104
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—96.2 **6 Claims**



1. A mechanical seal comprising a retainer ring having an inner cylindrical surface and an outer conical surface, said retainer ring having a longitudinal end defined by a planar surface disposed perpendicular to the axis of said cylindrical surface, said planar surface extending to the outer periphery of said retainer ring, an annular groove in said planar surface having a pair of side walls and a bottom wall, one of said pair of side walls being longer than the other of said pair of side walls, a slide member having an annular ring portion disposed in and mating with said groove, said annular ring portion and said groove having a dovetail configuration, said slide member having a planar portion disposed against and mating with said planar surface of said retainer ring, said slide member being made of a wear-resistant material, said retainer ring being made of a different material, said mating of said ring portion with said groove and said mating of said planar portion with said planar surface being an integral construction providing an integral juncture, said integral construction being formed by pouring the melted material which is to form said retainer ring around said annular ring portion and against said planar portion such that upon solidification thereof, said integral juncture is obtained, said slide member having a sliding surface disposed perpendicular to the longitudinal axis of said cylindrical surface, a second retainer ring and a second slide member of the same construction as the first said retainer ring and the first said slide member respectively, resilient sealing rings disposed on said conical surfaces of the first said retainer ring and said second retainer ring, the first said retainer ring and said second retainer ring being coaxially disposed such that said sliding surface of the first said sliding member slidingly abuts the sliding surface of said second sliding member along a sliding

plane of contact disposed perpendicular to the axis of said cylindrical surface.

4,489,953

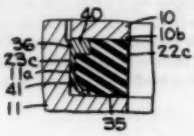
FIRE-SAFE SEAL FOR SWIVEL JOINT

Robert L. Witt, Conroe, Tex., assignor to FMC Corporation, Chicago, Ill.

Division of Ser. No. 329,492, Dec. 10, 1981,. This application Aug. 15, 1983, Ser. No. 523,510

Int. Cl.³ F16J *15/12, 15/18*

U.S. Cl. 277—188 A **2 Claims**



1. A fire-safe seal for a swivel joint having an annular inner element, an annular outer element surrounding said inner element, said outer element having a radially inward extending flange at one end thereof, and bearing means mounted between said outer element and said inner element, said fire-safe seal comprising:

a resilient annular seal mounted between said flange on said outer element and an end of said inner element to provide a fluid-tight seal between said inner and said outer elements; and

an anti-extrusion ring mounted between said resilient seal and a junction of said outer element and said end of said inner element, said anti-extrusion ring having a ring portion for providing a seal at said junction and a spring portion for pressing said ring portion against said junction to retain said anti-extrusion ring in a sealing position if said resilient seal should be destroyed.

4,489,954

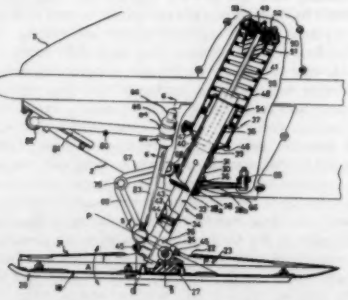
ANTI-ROLLING SYSTEM FOR SNOWMOBILE OF SMALL SIZE

Toshihiro Yasui, and Wayne L. Warnke, both of Coon Rapids, Minn., assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 213,167, Dec. 4, 1980,. This application Dec. 15, 1982, Ser. No. 450,075

Int. Cl.³ B62B *17/04*

U.S. Cl. 280—21 R **7 Claims**



1. A suspension and steering system for a snowmobile or the like having a body and a pair of skis comprising suspension means comprising a pair of struts having telescoping elements for suspending each of the skis for movement vertically relative to the body independently of each other, said suspension means permitting pivotal steering movement of each of said skis about a respective generally upstanding steering axis, and anti-roll means comprising a torsion bar supported by the body and means for connecting opposite ends of said torsion bar to respective skis for torsional loading of said torsion bar upon independent movement of the skis relative to the body, the connection between said torsion bar ends and the respective skis comprising a pair of generally vertically extending links, each of said links being disposed in front of and outwardly of a respective strut in a location to protect said struts from damage in the event the snowmobile encounters an obstruction in the direction of forward travel.

4,489,955

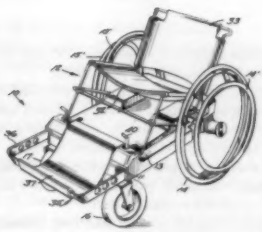
WHEELCHAIR

W. Duane Hamilton, Southbridge, Mass., assignor to N. A. Taylor Company, Inc., Gloversville, N.Y.

Filed Dec. 8, 1982, Ser. No. 447,987

Int. Cl.³ A61G *5/02*

U.S. Cl. 280—242 WC **19 Claims**



4. A wheelchair comprising:

a base frame comprising a pair of side plates and a web extending between said side plates;

a plurality of wheels including two drive wheels and at least one other wheel;

means for propelling said drive wheels, said means consisting of hand engagable rim means associated with said drive wheels;

means for mounting said wheels to said base frame so that they are rotatable with respect to said frame, but so that the wheelbase thereof is substantially fixed;

chair support means; and

means for mounting said chair support means to said frame so that the position of said chair support means with respect to said frame and with respect to said drive wheels is adjustable, so that the center of gravity of said wheelchair is adjustable by adjusting the portion of said chair support means with respect to said frame, and without adjustment of the position of said drive wheels with respect to said frame, said means comprising: a pair of inner and outer flanges of said chair means for receipt of each of said frame side plates; means defining elongated openings in said web adjacent each of said side plates; and fastener means extending through said elongated openings into operative association with said chair support means.

10. A wheelchair comprising:

a base frame;

two drive wheels and at least one other wheel; means for mounting said drive wheels to said base frame, said means comprising a separate shaft means operatively attached to each of said drive wheels and defining an axis of rotation of said drive wheels, and a block operatively mounted to said base frame for receipt of each of said shaft means;

means for operatively mounting each of said blocks to said base frame for operative pivotal movement with respect to said base frame about an axis substantially perpendicular to its respective drive wheel axis of rotation, so that the

camber of said rear wheels may be adjusted by operative pivotal movement of said blocks with respect to said base frame, said means comprising pin means associated with each block; and

means for effecting pivotal movement of said blocks with respect to said frame, said means comprising for each block an eccentric cam rotatable about an axis spaced from and parallel to said pin means, and an elongated slot receiving said eccentric cam; one of said cam and said slot being operatively associated with said frame, and the other of said cam and said slot being operatively associated with said block.

4,489,956

HEELHOLDER FOR SAFETY SKI BINDINGS

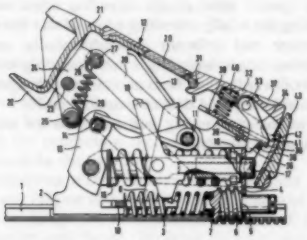
Roland Jungkind, Garmisch-Partenkirchen, Fed. Rep. of Germany, assignor to Marker Patentvertwertungsgesellschaft mbH., Baar, Switzerland

Filed Feb. 9, 1982, Ser. No. 347,099

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1981, 3107036

Int. Cl.³ A63C 9/084

U.S. Cl. 280—632 **8 Claims**



1. A heelholder for a safety ski binding extending in a longitudinal direction for attachment to a ski, said heelholder comprising:

a soleholder pivotably mounted on a support on a horizontal axis for movement between open and closed positions;

opening spring means biassing said soleholder towards the open position;

a first locking member mounted for movement in the longitudinal direction on said soleholder;

release controlling spring means biassing said first locking member in the forward direction;

actuating means mounted on said soleholder, said actuating means being releasably engageable by said first locking member when said soleholder is in the closed position to releasably retain said soleholder in the closed position;

a second locking lever movably mounted on the support and having a locking condition for releasably locking said actuating means in engagement with said first locking member to releasably retain said soleholder in the closed position;

retaining spring means biassing said second locking member to said locking condition;

manual release means for moving said second locking member out of said locking condition for manually moving said soleholder from the closed position to the open position;

stop means fixed relative to the soleholder; and

an interposed member disposed between said manual release means and said second locking member, said stop means cooperating with said interposed member for moving said second locking member out of the locking condition when a ski boot is moved out of the soleholder in its closed position without overcoming the bias of said release controlling spring, and said interposed member being disabled from moving said second locking lever out of the locking condition upon actuation of said manual release means during movement of the soleholder from the open position to the closed position.

4,489,957

TOOL FOR SAILING WITH SKATES ETC.

Klas Holmgren, Tulegatan 45III, 113 53 Stockholm Sverige, Sweden

PCT No. PCT/SE80/00281, § 371 Date Apr. 19, 1982, § 102(e) Date Apr. 19, 1982, PCT Pub. No. WO82/00593, PCT Pub. Date Mar. 4, 1982

PCT Filed Nov. 7, 1980, Ser. No. 375,032

Claims priority, application Sweden, Aug. 19, 1980, 8005834

Int. Cl.³ A63C 3/00

U.S. Cl. 280—810 **10 Claims**

1. A tool for sailing with any of skates, skis, roller-skates and corresponding gear, comprising a carrier bar, fastening means movable relative to said carrier bar for connection of said carrier bar proximate to the sailor's feet, centering means attaching said fastening means to said carrier bar for controlling the position of said fastening means relative to said carrier bar so that the center of said carrier bar remains substantially half-way between said fastening means regardless of the distance therebetween, and a holder articulately mounted at the center of said carrier bar for fastening a sail-carrying mast.

4,489,958

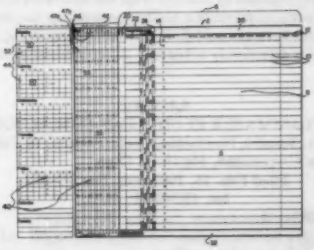
PERSONAL TIME MANAGEMENT INSTRUMENT

Alain P. Martin, 79 Fentiman Ave., Ottawa, Ontario K1S 0T7, Canada

Filed Sep. 8, 1982, Ser. No. 416,095

Int. Cl.³ B42D 5/04, 15/00

U.S. Cl. 283—3 **11 Claims**



1. A single sheet for personal time management for a time period consisting of a plurality of days comprising:

(a) an activity section comprising a wide vertical column divided into spaces by a series of horizontal lines, in each of which spaces an activity may be written; and

(b) a calendar section comprising a vertical column extend-

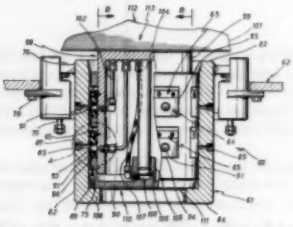
ing the length of and positioned beside the activity section, the calendar section column being subdivided into adjacent vertical subcolumns, one such subcolumn designated for each day in the time period, the horizontal lines from the activity section extending through the subcolumns to thereby provide a grid unit in each subcolumn particular to each activity space, said calendar section further comprising a series of blocks, one block representing each day in the time period, each block as required being subdivided into a series of spaces marked to sequentially designate times in a day, one such space in each block representing a different one of such times.

4,489,959

UNDERWATER CONNECTOR

Lawrence E. Satterwhite, 101 Butlers Ct., Conroe, Tex. 77302

Filed Mar. 22, 1982, Ser. No. 360,161
Int. Cl.³ F16L *55/00, 25/00, 5/00*
U.S. Cl. 285—18 **9 Claims**



1. An underwater connector comprising:
a hollow first body including at least one first conduit for the passage of a fluid therethrough and having an end thereof communicating with the interior of the first body;
a second body which fits within the first body and includes at least one second conduit for the passage of a fluid therethrough and having an end thereof communicating with the exterior surface of the second body;
at least one deformable sealing means mounted within an opening in the second body and disposed about the end of the second conduit, said sealing means being disposed in a first position spaced from the interior surface of the first body and aligned with the end of the first conduit in the first body, said sealing means comprising at least one resilient insert having an opening therethrough and encircling the end of the second conduit;
compression means for selectively deforming the sealing means whereby the sealing means is forced outwardly to a second position in contact with the interior surface of the first body to provide a sealed passageway for the passage of fluid between said first and second conduits; and
means for selectively actuating the compression means.

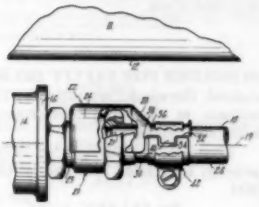
4,489,960

FLAMMABLE FLUID LEAK DEFLECTOR

Clement A. Senatro, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 16, 1982, Ser. No. 348,891
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—45 **1 Claim**

1. In a gas turbine engine the combination of:
means defining a hot surface;
a flammable fluid carrying tube having an axis, an end, an outer surface, said tube end being closely spaced from said hot surface;
tube coupling means surrounding said tube end forming a tube joint;
an arcuate sleeve segment axially adjacent said tube coupling and disposed against and bonded to that portion of said tube outer surface facing away from said hot surface, said sleeve segment having axially extending circumferentially spaced apart edges, at least one of said edges including a cutout therein;
an arcuate deflector disposed between said coupling means and said hot surface, partially surrounding said coupling means for deflecting away from said hot surface, flammable fluid leaking from said tube joint, one end of said deflector including an arcuate, axial extension disposed



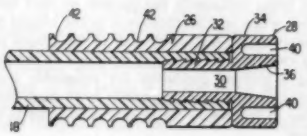
against said tube outer surface and having circumferentially spaced apart axially extending edges substantially abutting the axially extending edges of said sleeve segment to orient said deflector circumferentially, one of said extension edges including a tab extending circumferentially outwardly therefrom into said sleeve segment cutout for positioning said deflector axially; and
clamp means surrounding said extension for securing said deflector to said tube.

4,489,961

TERMINAL FOR FLEXIBLE TUBE

Manfred R. Laidig, Whippany, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Apr. 18, 1983, Ser. No. 485,761
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—116 **2 Claims**



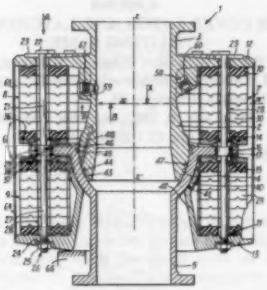
1. A multipart terminal for a flexible tube, said terminal including a flexible molded plastic sleeve in tight fitting supporting engagement with an end portion of the tube, the terminal also including a molded plastic end fitting with a male serrated end portion extending into a portion of the sleeve engaged length of the tube which is thereby held securely relative to both the fitting and sleeve, said fitting being formed with a through opening that is tapered in an opposite end portion of the fitting from the serrated portion, and a length of the sleeve, other than the part in engagement with that portion of the tube wherein the serrated male end portion of the fitting extends, being formed to render such length more flexible than the said other part.

4,489,962

SWIVEL-JOINT FOR THE BASE OF A RISER-PIPE

Jean-Paul Caumont, Pau, and Jean-Claude Schawann, Idron, both of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Sep. 23, 1982, Ser. No. 421,821
Claims priority, application France, Oct. 9, 1981, 81 19070
Int. Cl.³ F16L 27/04, 17/00
U.S. Cl. 285—263 18 Claims



1. A joint for the base of a riser pipe, comprising a ring-shaped sperical male adapter (2) at the end of a first pipe (3), a ring-shaped spherical female adapter (4) at the end of a second pipe (5), the female adapter receiving the male adapter (2), and means (6) for connecting the two adapters, this joint being characterized by the fact that:

said connecting means includes spaced annular end plates (12) and (13) on said male adapter and coaxial therewith;

an annular flange (20) on said female adapter (4) and coaxial therewith, said flange (20) lying between said end plates (12) and (13);

resilient means (7) extending between said end-plates (12) and (13) and coaxial therewith, and including spaced crowns (8) and (9);

said crowns (8) and (9) having remote annular faces seated respectively on said end-plates (12) and (13),

adjacent ends (14) and (15) of said crowns being spaced apart with said annular flange (20) extending therebetween;

collar means (29) associated with said male adapter at said flange;

said adjacent ends (14) and (15) contacting on said collar means (29) when the adapters (2) and (4) are coaxially aligned;

said adjacent ends (14, 15) of said crowns, when the axes of two adapters form an angle, being separable by diametrically opposite compression of said crowns (8) and (9) whereby one of said adjacent ends (14, 15) bears against one face of said flange (20) and the other of said adjacent ends (14, 15) bears against the opposite face of said flange (20) in diametrically opposite relation.

4,489,963

PIPE JOINT

George M. Raulins; George G. Grimmer, both of Farmers Branch, Tex., and James L. Peterson, Gretna, La., assignors to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 367,952, Apr. 13, 1982, , and Ser. No. 456,526, Jan. 7, 1983, Pat. No. 4,433,862. This application Feb. 24, 1984, Ser. No. 583,176
Int. Cl.³ F16L 19/00, 25/00, 15/00
U.S. Cl. 285—350 7 Claims

1. A pipe joint comprising,

a box having a tapered thread and an annular primary seal surface,

an annular seal groove in the box at the last thread,

an annular seal member of compressible material in said seal groove,

a step between said primary seal surface and said seal groove,

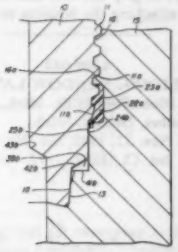
an annular secondary seal surface between said step and seal groove,

a pipe having a tapered thread and an annular primary seal surface for sealing engagement with the primary seal surface of the box,

said pipe thread extending into said seal groove when the pipe joint is fully made up,

an annular secondary seal surface on said pipe between the thread and primary seal surface for engaging said secondary seal surface in the box,

a step between said primary and secondary seal surfaces on said pipe and spaced from said step in the box when the joint is fully made up to provide a space for receiving any seal material extruded past said secondary seal surfaces,



said box and pipe having the following approximate relationship:

$$tb/Db = tp/Dp$$

wherein, tb is the thickness of the box wall at the largest diameter point of sealing engagement between said primary sealing surfaces, Db is the outer diameter of the box at the point where tb is measured, tp is the full wall thickness of the pipe, and Dp is the diameter of the pipe at the full wall thickness,

said primary seal surfaces provided by frusto-conical surfaces extending at a first identical taper,

said secondary seal surfaces provided by frustoconical surfaces extending at a second identical taper which is less than said first taper,

said secondary seal surfaces engaging during make-up of the joint prior to the engagement of said primary seal surfaces and prior to any significant extrusion of said resilient seal.

4,489,964

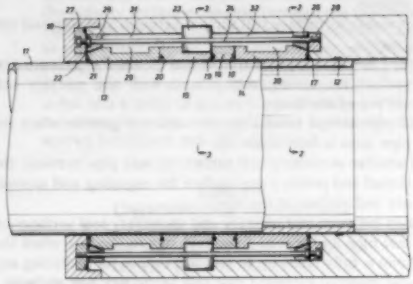
MEMORY METAL CONNECTOR

Robert M. Kipp, and Ray R. Ayers, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 30, 1981, Ser. No. 335,913
Int. Cl.³ F16L 21/00
U.S. Cl. 285—374 4 Claims

1. A connector for joining two pipe ends comprising, a connector housing associated with one pipe end and which is insertable over the other pipe end, memory metal means operative within the housing at a predetermined temperature to grip

the other pipe end, additional memory metal means operative with the housing at a temperature higher than said predetermined temperature to grip the first said memory metal means, thereby securely attaching the housing to said other pipe end.

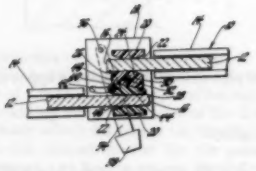


4,489,965

SLIDING WINDOW LATCH

Philip E. Taylor, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1982, Ser. No. 443,380
Int. Cl.³ E05C *1/12, 7/00*
U.S. Cl. 292—34 **2 Claims**



1. A latching mechanism for latching a pair of relatively slidable overlapping window panels, either one of which is slidable, to each other at an infinite number of relative positions, comprising,

a mounting member,

a pair of opposed support blocks fixed to the mounting member, each block having a bearing surface engageable with the outside surface of a respective window panel at the overlap thereof,

a first wedging block located between the opposed support blocks,

said first wedging block having a bearing surface engageable with the inside surface of one window panel opposite one support block and a wedging surface spaced from the inside surface of the other window panel,

means floatingly mounting the first wedging block to the mounting member to allow its bearing surface to be moved freely into and out of engagement with the inside surface of the one window panel,

a second wedging block located in the space between said first wedging block and said other window panel including a bearing surface engageable with the inside surface of the other window panel opposite the other support block and a wedging surface engageable with the wedging surface of the first wedging block,

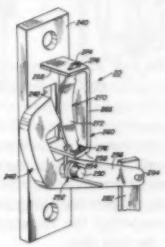
and means for moving the second wedging block at any relative position of said window panels between an operative position wedged between the first wedging block and the inside surface of the other window panel to bias the bearing surfaces of the wedging blocks into the inside surfaces of the window panels to in turn force the outside surfaces of the window panels into the bearing surfaces of the support blocks and latch the window panels in an infinite number of overlap positions and an inoperative position free of wedging engagement with the first wedging block, said means floatingly mounting said first wedging block allowing the bearing surface of said wedging block to be moved away from the inside surface of said one window panel to free the window panels for relative sliding movement.

4,489,966

DOOR OR COVER LATCH AND LATCHING SYSTEM UTILIZING SAME

Emmett R. Beebe, Glenview; Edmund S. Dizon, Chicago, and Arvydas J. Kalvaitis, Northbrook, all of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Apr. 8, 1982, Ser. No. 366,498
Int. Cl.³ E05C *3/12*
U.S. Cl. 292—334 **26 Claims**



1. A lockable door latch for holding a door closed, the door being associated with an enclosure such that the enclosure is inaccessible when the door is closed and accessible when the door is opened, the latch comprising:

at least one projection associated with the enclosure;

a latching arm associated with each projection for engaging its associated projection to latch the door when it is closed;

biasing means associated with each latching arm for biasing such latching arm towards its respective projection;

selective moving means associated with the door for moving each latching arm against its respective biasing means to disengage each respective projection to unlatch the door;

a latching arm blocking member associated with each latching arm for blocking each such latching arm from engaging its respective projection except when the door is closed;

a passageway through the door;

a locking staple associated with the enclosure which protrudes through the passageway when the door is closed for receiving a lock shackle therein; and

a shield means for preventing such reception of the lock shackle when the door is not closed.

4,489,967

STRUCTURE FOR REMOVABLY MOUNTING SUPPORT ROD FOR OPENABLE CLOSURE MEMBER OF MOTOR VEHICLE

Tatsuhiko Matsui, Zama; Hiroyuki Aida, Hatano, and Tomoyoshi Ohnuki, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited and Kato Hatsujo Kaisha, Limited, both of Yokohama, Japan

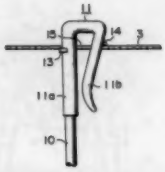
Filed Oct. 5, 1983, Ser. No. 539,301
Claims priority, application Japan, Oct. 6, 1982, 57-175946
Int. Cl.³ E05C *17/12*
U.S. Cl. 292—339 **4 Claims**

1. A structure for removably mounting a support rod for

supporting an openable closure such as engine hood of a motor vehicle at its open position, comprising:

a retainer means formed of a plastic material including a first arm, a second arm which is resiliently deformable toward said first arm, said retainer means being adapted to be attached to one end of the support rod;

said first arm being provided with a support means to support the weight of the closure member when the latter is supported at its open position by means of the support rod;



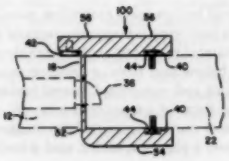
said second arm being adapted, when deformed, to be inserted in a mounting aperture formed in the motor vehicle, said second arm being provided with an engagement means adapted to be brought into engagement with the margin of said mounting aperture when said second arm returns from its deformed configuration to its original configuration, thereby securely mounting the support rod in place so that the closure member is therby supported at its open position.

4,489,968

SELECTIVELY OPERABLE DOORSTOP FOR CONVERTING A DOUBLE-ACTING DOOR TO A SINGLE-ACTING DOOR

Thomas E. Easley, 1303 Fourth St., LaGrande, Oreg. 97850

Filed Sep. 21, 1981, Ser. No. 303,781
Int. Cl.³ E05C *21/02*
U.S. Cl. 292—340 **10 Claims**



1. A selectively operable doorstop for converting a double-acting door having a closed position and two open positions to a single-acting door having a closed position and one open position, said door having top and bottom ends, a hinged edge and a swinging edge and having a fixed support opposite and immediately adjacent to said swinging edge in said closed position, said doorstop comprising:

(a) intercept means, having operative and inoperative modes respectively, for selectively either intercepting and preventing said swinging edge from moving beyond said closed position to one of said open positions while permitting free swinging movement of said swinging edge to the other of said open positions when in said operative mode or, alternatively, selectively permitting free swinging movement of said swinging edge to either of said two open positions when in said inoperative mode;

(b) intercept mounting means for fixedly fastening to said fixed support between said top and bottom ends of said door; and

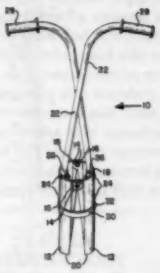
(c) mating engagement means, on said intercept means and said mounting means respectively, for mounting said intercept means movably on said mounting means so as to permit selective movement of said intercept means relative to said mounting means between said operative and inoperative modes respectively, said engagement means including means for selectively removably mounting said intercept means on said mounting means and means for permitting said intercept means to slide vertically with respect to said mounting means.

4,489,969

CLAM DIGGING TOOL

Clayton Merry, Star Rte., Box 48, Leavenworth, Wash. 98826

Filed Sep. 30, 1982, Ser. No. 428,723
Int. Cl.³ A01B *1/18*
U.S. Cl. 294—50.8 **14 Claims**



1. A clam digging tool for removing a clam and sand surrounding the clam from clam beds, comprising:

(a) a plurality of pivotally interconnected shovel segments defining a generally circular boring means, each segment including:

(i) a nose for penetrating into the sand;

(ii) a butt laterally opposite the nose; and

(iii) a pair of spaced ears on opposite sides of segment for pivotally connecting the segment with the other segments by overlapping respective ears;

(b) means for allowing a downwardly directed force to be exerted on the segments so that the segments penetrate, nose first, into the sand around a clam and for allowing an inwardly directed force to be exerted on the sand through the segments so that the sand and clam can be removed when withdrawing the tool from the sand; and

(c) an endless belt attached to one segment between the nose and the butt and encircling the segments to define a stop against outward pivoting of the segments.

4,489,970

APPARATUS FOR LIFTING HEAVY METAL PLATE MATERIALS

John R. Henke, Kansas City, Mo., assignor to Dean Research Corporation, Kansas City, Mo.

Filed Jun. 6, 1983, Ser. No. 501,254
Int. Cl.³ B66C *1/22*
U.S. Cl. 294—67 AB **19 Claims**

1. Apparatus for lifting one or more relatively heavy, generally unwieldy plates comprising:

first engagement means for operably engaging one marginal end of a plate or adjacent marginal ends of a plurality of stacked plates;

second engagement means for operably engaging a second opposed marginal end of said plate or the adjacent opposed marginal ends of said plurality of plates;

means interconnecting said first and second engagement means and operable to move the same toward each other into plate engaging relationship;

guide means operably associated with one of said plate en-

gagement means and movable from a position allowing said one plate engagement means to engage one or more of said plates, to a location preventing the one plate engagement means from contacting a respective adjacent marginal end or ends of a plate or plates when the first and second engagement means are allowed to shift away from each other to an extent to cause said one engagement means to clear the corresponding adjacent marginal end or ends of the plate or plates, and then moved toward each

other through a displacement that said one engagement means would reengage the proximal marginal end or ends of the plate or plates if it were not for the guide means being in said location thereof; and

means for shifting one of said first and second plate engagement means in a direction out of lifting engagement with said one or more plates when lifting thereof is completed and the one of said plate engagement means associated with said shifting means is shifted away from the adjacent margin of said one or more plates.

4,489,971

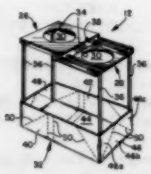
COLLAPSIBLE PENSILE FOOD CARRIER

Alfonso E. Martinez, Sr., 1019 Hickey Ave., Alice, Tex. 78332

Filed Feb. 10, 1983, Ser. No. 465,627

Int. Cl.[3] **B65D** *73/00*

U.S. Cl. 294—143 **4 Claims**



1. Collapsible pensile food carrier comprising substantially rigid beverage support means, foldable auxiliary receptacle means and foldable strap means for suspending said auxiliary receptacle means from said beverage support means, said beverage support means further comprising two substantially rigid, slidably engaged beverage support members, each of which is adapted by means of at least one aperture disposed therethrough to receive and maintain at least one beverage cup in a substantially upright position.

4,489,972

MOTOR VEHICLE WITH TRAPEZOIDAL PASSENGER COMPARTMENT AND COMPACT SEATING ARRANGEMENT

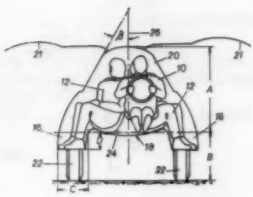
Renato Monzini, Via Conte Verde, 16, Milan, Italy 20100

Filed Apr. 7, 1982, Ser. No. 366,201

Claims priority, application Italy, Apr. 30, 1981, 21472 A/81

Int. Cl.[3] **B60N** *1/00;* **B62D** *35/00*

U.S. Cl. 296—64 **8 Claims**



1. A motor vehicle for a plurality of passengers comprising:

a body having a longitudinal axis lying in a direction of travel of the motor vehicle, a floor, a ceiling and a pair of side walls each extending from said floor to said ceiling, defining a passenger compartment;

a plurality of seats in said compartment lying in two rows extending along said longitudinal axis, each row lying adjacent one of said pair of side walls and facing at an acute angle with respect to said longitudinal axis, each seat of one of said two rows being offset with respect to each seat of the other of said two rows along said longitudinal axis so that heads and shoulders of passengers sitting in said seats are in a position of close relationship in said compartment;

said pair of side walls converging toward each other in a direction upwardly of said wall at about a position of waists of passengers sitting in said seats and above said position of close relationship, at an acute angle with respect to a vertical line extending through said longitudinal axis; and

a pair of lateral bodies each extending parallel to said longitudinal axis and lying on opposite sides of said longitudinal axis, each lateral body connected to said compartment and extending below said floor, a cross sectional shape of said compartment and connected lateral bodies being substantially in the form of a truncated letter A, said floor corresponding to a cross member of the truncated letter A and spaced above a plane on which said wheels are adapted to roll.

4,489,973

MOUNTING SYSTEMS FOR MOTORCYCLE WINDSHIELDS AND FAIRINGS

Barry A. Willey, 138 S. 8th Ave., Maywood, Ill. 60153

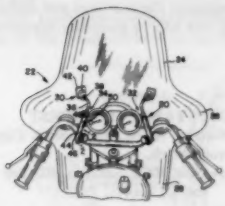
Filed Jan. 17, 1983, Ser. No. 458,551

Int. Cl.[3] **B62J** *17/04*

U.S. Cl. 296—78.1 **16 Claims**

1. A windshield mounting assembly for a motorcycle windshield or the like, said assembly comprising, in combination, a clamp portion adapted to be snugly received over the handlebar portion of an associated cycle, said clamp portion also including means for positioning a portion of a windshield brace assembly for rotation through a range of angular adjustment positions, a shield brace assembly having one end portion adapted to be removably positoned with respect to said clamp, said end also being arranged to prevent radial movement of said one brace end when said brace assembly is positioned for adjustment, a fastener adapted to cooperate with said clamp in securing said one brace end, said shield brace assembly further including cooperating portions also arranged for movement through a range of adjustment positions, and means for locking

said cooperating portions to said brace in a desired position of adjustment, one of said cooperating portions having means on a free end thereof for attachment to a portion of a cycle windshield, said one brace end and said clamp having interlockable means for preventing movement of said brace from a desired



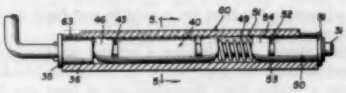
position of angular adjustment when said brace end and said clamp are fastened together, said fastener also being constructed and arranged for hand tightening so as to lock said brace end to said clamp in said desired position of angular adjustment.

4,489,974

VISOR ASSEMBLY INCLUDING FRICTION MOUNT

John G. Warhol, 14041 Vernon Ave., Oak Park, Mich. 48237

Filed Sep. 27, 1982, Ser. No. 423,677
Int. Cl.³ B60J *3/00*
U.S. Cl. 296—97 K **34 Claims**



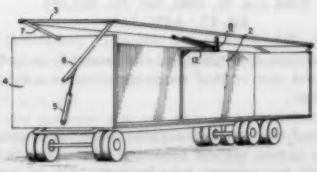
1. A rotatable friction mount for a visor or the like comprising a fixed inner elongated member having a flexible portion resiliently movable with respect to the remainder of said inner elongated member, an outer tubular member telescopically surrounding said inner member and rotatable with respect thereto about the longitudinal axis of said outer member, and discrete bias means coupled to said inner member and resiliently urging said flexible portion axially and radially of said outer member into frictional engagement therewith thereby to inhibit rotational movement thereof.

4,489,975

SUPPORT APPARATUS FOR A RAISED SIDE PANEL OF A TRUCK OR TRAILER

Sture Fredin, Bjuråker, Sweden, assignor to Thycho Fredin AB, Bjuråker, Sweden

Filed Sep. 9, 1982, Ser. No. 416,388
Claims priority, application Sweden, Sep. 14, 1981, 8105453
Int. Cl.³ B62D *33/00;* **B60P** *3/04;* **B61D** *17/00*
U.S. Cl. 296—181 **6 Claims**



1. A support apparatus for a vehicle having a stationary side wall and a maneuverable side member arranged opposite to said side wall, said side member being rotatably mounted to said vehicle so that said side member can be rotated to a raised position above said vehicle and subsequently to a lowered position comprising

a cantilever having one end attached to said side wall and an opposite end extending towards said side member;

a bracket attached to said opposite end;

first and second side member arms spaced from each other and each having a first end rotatably mounted to said bracket and a second end rotatably mounted to said side member;

a side member support positioned between said side member arms and having an end rotatably mounted to said bracket and an opposite free end extending, in a first position, towards said side member;

means attached to said side member support and at least one of said side member arms for causing said side member support to be rotated from said first position to a predetermined second position, when said side member is rotated to a raised position above said vehicle, so that said free end supportively engages said side member; and,

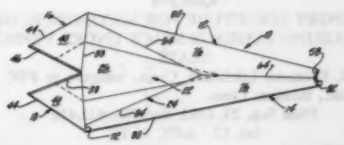
a carrier extending between said side arms, attached thereto and positioned above said side member support for engagement with said side member support, when said side member support is rotated to a lowered position, to return said side member support to said first position.

4,489,976

VEHICLE BODY

B. Michael Flaherty, 8730 Ferry Rd., Grosse Ile, Mich. 48138

Continuation-in-part of Ser. No. 448,299, Dec. 9, 1982, abandoned. This application Oct. 14, 1983, Ser. No. 541,868
Int. Cl.³ B62D *31/00*
U.S. Cl. 296—185 **24 Claims**



1. A vehicle body comprising a pair of opposite front side panels formed of a self-supporting material and having rectilinear top and bottom edges, each side panel comprising an upper portion and a lower portion connected along a generally horizontal straight line extending longitudinally of the body, each upper panel portion being inclined laterally inwardly in an upwardly direction from said connection line and each lower panel portion inclined laterally inwardly and downwardly from said connection line, said side panels being generally mirror images of each other, the bottom straight edges of one panel being secured directly to the bottom straight edges of the other panel such that the portion of the body below said straight connection lines is of generally triangular shape in transverse cross section.

4,489,977

PICKUP TRUCK WITH INTERCHANGEABLE BED COMPONENTS

James F. Earing, Jr., 3602 NE. 115th Ave., Portland, Oreg. 97220

Filed Jun. 21, 1982, Ser. No. 390,265
Int. Cl.³ B62D *23/00*
U.S. Cl. 296—35.3 **1 Claim**

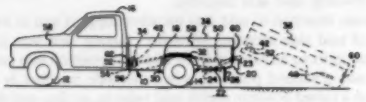
1. A pickup truck assembly with interchangeable bed components, comprising in combination:

(a) a pickup truck having a frame mounted on a pair of front wheels and a pair of axle-mounted rear wheels, and a cab

mounted on the frame, the frame including a pair of laterally spaced, longitudinally extending beam members curved upward intermediate their ends to extend over the rear wheel axle,

(b) an upwardly opening channel truck mounted on each beam member and extending substantially from the cab toward the rear end of the frame, the tracks conforming substantially to the curved shape of the beam members and terminating at their front ends in upwardly and rearwardly curled segments arranged to releasably capture wheels therein for securing the wheels against forward, lateral and upward displacement therefrom, and

(c) a bed component for removable mounting behind the cab and comprising:



(1) a cargo-supporting surface,

(2) a pair of laterally spaced bed support wheels on the forward end of the bed arranged to movably engage the laterally spaced tracks on the truck frame beam members for movement along the latter into and out of releasable capture in said curled segments of the tracks for releasably securing the front end of the bed component to the truck frame, and

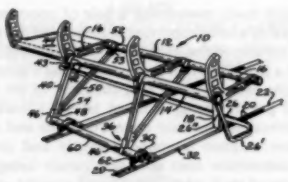
(3) rearward bed securing means on the rearward ends of the bed component and truck frame arranged for releasable connection for securing the rearward end of the bed to the truck frame against rearward, lateral and upward displacement relative to the truck frame.

4,489,978

SUPPORT STRUCTURE FOR MAXIMIZING OR EQUALIZING LUGGAGE SPACE UNDER VEHICLE SEATS

Edward J. Brennan, Litchfield, Conn., assignor to PTC Aerospace Inc., Bantam, Conn.

Filed Sep. 23, 1982, Ser. No. 422,410
Int. Cl.³ A47C *15/00*
U.S. Cl. 297—232 **10 Claims**



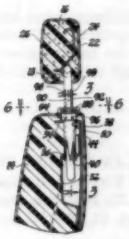
1. A support structure for permitting the storage space under the seats of a multi-passenger aircraft seating unit to be maximized or equalized when the unit is to be mounted to a pair of spaced, parallel slotted floor tracks which, if used to directly mount the unit's rear legs, would provide unequal space under the seats, said structure comprising frame means for supporting at least a major portion of the width of at least one seat position in said unit in a cantilever fashion; a pair of vertically positioned front legs attached to said frame means at their upper ends and having fittings at their lower ends adapted to directly engage said slotted floor tracks; a pair of vertically positioned rear legs attached at their upper ends to a rear portion of said frame means at locations laterally spaced from said front legs; a pair of diagonal braces, each of said braces being arranged in a vertical plane and mounted at its forward end to said frame means and at its rearward end to one of said pair of rear legs at the lower end thereof; a lower, elongated rear stretcher element having a length considerably less than the length of the frame means, said lower rear stretcher element being mounted at spaced locations along its length to said pair of slotted floor tracks; said pair of rear legs being mountable at their lower ends to said lower rear stretcher element at one of a plurality of points laterally spaced from said slotted floor tracks so that the storage space adjacent the rear legs and under each of the seats of said seating unit will be generally maximized or equalized.

4,489,979

ADJUSTABLE HEADREST

John F. Zyngier, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 30, 1982, Ser. No. 403,798
Int. Cl.³ A47C *7/36*
U.S. Cl. 297—391 **3 Claims**



1. An adjustable headrest for a vehicle seat back having an apertured mounting bracket comprising:

a molded plastic guide having a tubular body adapted to extend through the aperture of the mounting bracket and having a central bore therethrough, at least one flexure finger molded integrally with the tubular body and having a free state radially contracted position in which the flexure finger projects within the central bore, and locking abutment means integral with the flexure finger and projecting therefrom; and

a support post connected to the headrest and adapted to be inserted through the central bore of the tubular guide and into engagement with the flexure finger to effect forced radial outward flexure of the flexure finger to move the locking abutment means into engagement with the mounting bracket to prevent removal of the plastic guide from the mounting bracket, said forced radial outward flexure of the flexure finger from the free state radial contracted position causing a radial inward bias of the flexure finger to frictionally engage the support post and thereby maintain the support post and headrest at a vertically adjusted position relative the seat back.

4,489,980

ADJUSTABLE ARM REST TRIGGER HANDLE

Paul H. Friedrich, Camarillo, Calif., assignor to Everest & Jennings, Inc., Camarillo, Calif.

Filed Jan. 31, 1983, Ser. No. 462,341
Int. Cl.³ A47C *7/54*
U.S. Cl. 297—411 **3 Claims**

1. A wheelchair adjustable arm rest assembly including:

(a) front and rear vertical receiving tubes on a side of the wheelchair;

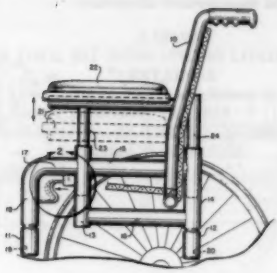
(b) an arm rest;

(c) front and rear arm rest support tubes telescopically receivable in said vertical receiving tubes respectively the front arm rest support tube having a seris of vertically spaced holes in its front wall and the front vertical receiving tube having a single hole in its front wall positioned to be in successive registration with said series of vertically

spaced holes as the arm rest support tubes are raised and lowered to adjust the height of the arm rest;

(d) a single integral S shaped rod having the upper horizontal extending end of the S shape positioned in front of said single hole for movement through the single hole into a registering hole to lock the telescoping tubes in a given position; and

(e) a front post having an horizontal portion extending from the front of the front vertical receiving tube above said



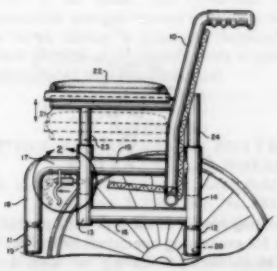
single hole, thence turning downwardly into a vertical portion connecting to said wheelchair, the rear wall of said vertical portion of said front post having a guide hole facing rearwardly in a position to receive the lower horizontal extending end of the S shape to guide horizontal movement of the rod into and out of a registering hole and to provide stability for the rod when moved back and forth in an horizontal direction to lock and unlock the arm rest support tube, said S shape defining a trigger handle for operation by a patient in the wheelchair.

4,489,981

WHEELCHAIR ADJUSTABLE ARM REST ASSEMBLY

Bert J. Goletski, Los Angeles, Calif., assignor to Everest & Jennings, Inc., Camarillo, Calif.

Filed Jan. 31, 1983, Ser. No. 462,342
Int. Cl.³ A47C 7/54
U.S. Cl. 297—411 **2 Claims**



1. A wheelchair adjustable arm rest assembly including:

(a) front and rear vertical receiving tubes on a side of the wheelchair;

(b) an arm rest;

(c) front and rear arm rest support tubes telescopically receivable in said vertical receiving tubes respectively the front arm rest support tube having a series of vertically spaced holes in its front wall and the front vertical receiving tube having a single hole in its front wall positioned to be in successive registration with said series of vertically spaced holes as the arm rest support tubes are raised and lowered to adjust the height of the arm rest;

(d) spring biased pin means in front of said single hole including a pin for movement through the single hole and into a registering hole to lock the telescoping tubes in a given position;

(e) a front post having an horizontal portion extending from the front of the front vertical receiving tube above said single hole, thence turning downwardly into a vertical portion connecting to said wheelchair, said spring-biased pin means including a guide barrel secured to the underside of said horizontal portion of said front post, said pin being slidable in said guide barrel;

(f) a handle secured to said pin, said handle facing rearwardly and having a concave surface for engagement by the web of a patient's hand between the thumb and forefinger so that forward pushing of the handle by the patient retracts the pin so that vertical adjustment of the arm rest can be made;

and

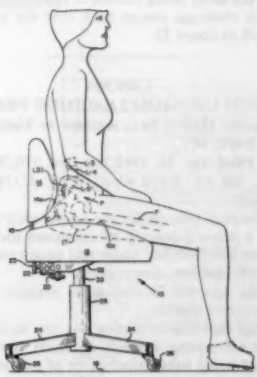
(g) a spring biasing said pin into said single hole so that when said handle is released, said pin is automatically biased into one of said series of holes when the same is in registration with said hole; the upper end of said handle defining a cradle engaging the underside of said horizontal portion of said front post to stabilize guiding movement of said pin in said barrel.

4,489,982

PELVIC SUPPORT METHOD AND MEANS

Winston G. Morrow, Lake Oswego, Oreg., assignor to Spinal Dynamics, Inc., Lake Oswego, Oreg.

Continuation of Ser. No. 210,212, Nov. 25, 1980,. This application Sep. 30, 1983, Ser. No. 537,822
Int. Cl.³ A47C 7/02
U.S. Cl. 297—458 **9 Claims**



1. A method of seating a person to achieve ligamentous posture, comprising

seating the person on a substantially horizontal upwardly convex resilient seat means having an apex extending across the width thereof with the ischial tuberosities positioned proximal the apex thereof,

adjusting the seat means to a height such that the person's feet rest flat on the floor, the seat means being sufficiently short and firm such that the person's femur heads are slightly downwardly inclined in the forward direction; and

supporting the posterior portion of the person's pelvis by providing on the seat means a back support pressing a forwardly convex pillow against the region immediately behind and at the elevation of the person's ilia and sacrum

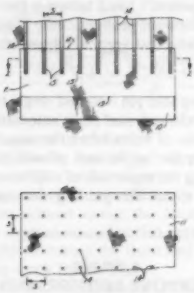
and allowing the person's back to be substantially unsupported in the lumbar region, thereby to produce a substantial sacral base angle and prevent rotational shifting of the pelvis.

4,489,983

BLASTHOLE SPACING FOR CONTROL OF PARTICLE SIZE

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Dec. 29, 1982, Ser. No. 454,449
Int. Cl.³ E21B *43/263*; E21C *41/10*
U.S. Cl. 299—2 **23 Claims**



1. A method for explosively expanding formation containing oil shale comprising forming an array of a plurality of blastholes that are approximately perpendicular to a free face of formation containing oil shale and having naturally occurring cleavage planes, the spacing distance (S) between adjacent blastholes in the array being related to the average distance (D) between such cleavage planes such that the ratio of S/D is from about 10 to about 22.

4,489,984

IN-SITU URANIUM LEACHING PROCESS

Joseph G. Savins, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 22, 1982, Ser. No. 370,704
Int. Cl.³ E21B *43/28*; E21C *41/14*
U.S. Cl. 299—5 **34 Claims**

23. An improved process for the in-situ recovery of mineral values from a mineral-bearing subterranean formation having heterogeneous permeability zones and penetrated by injection and production systems, comprising:

(a) injecting into the formation an oxidant to oxidize the mineral values therein;

(b) injecting into the formation via the injection system a lixiviant containing a leaching agent and a thickening agent and being substantially free of oxidant;

(c) displacing the lixiviant through the subterranean formation to solubilize the mineral values therein;

(d) producing pregnant lixiviant containing mineral values via the production system; and

(e) treating the pregnant lixiviant to recover mineral values therefrom.

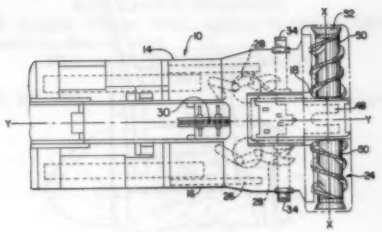
4,489,985

CUTTER DRUM EXTENSION LATCHING MECHANISM

Frank B. Kendrick, Franklin, Pa., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Jul. 1, 1982, Ser. No. 394,348
Int. Cl.³ E21C *27/24*
U.S. Cl. 299—80 **6 Claims**

1. An improved mining machine cutting structure having a unitary support member, an elongated cutting head assembly mounted at the forward end of said support member for powered rotation about a longitudinal axis of said head assembly, said cutting head assembly having a centrally located main cutting head portion and drum extension portions located at the ends of said cutting head axially outward of said main cutting head portion, said drum extension portions capable of moving in an axial direction to and from an extended position with respect to said main cutting head portion, and a hydraulic cylinder including a piston rod connected to said end portions for the selective extension and retraction of said end portions, wherein the improvement comprises:



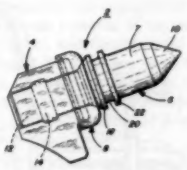
at least one latch element associated with each extension portion and said main cutting head, a spring means for moving said latch element into locking engagement between said head said drum extension when said extension is in extended position to prevent non-selective retraction thereof, and a camming element associated with said piston rod for movement therewith for moving said latch element out of locking engagement between said head and said drum extension portion during a portion of the stroke of said piston rod prior to the selective retraction of said drum extension portion.

4,489,986

WEAR COLLAR DEVICE FOR ROTATABLE CUTTER BIT

William A. Dziak, 15100 Tokay Ave., Maple Heights, Ohio 44137

Filed Nov. 1, 1982, Ser. No. 438,018
Int. Cl.³ E21C *35/22*
U.S. Cl. 299—86 **5 Claims**



1. A mounting system of the type for detachably supporting a cutter bit for excavating operations or the like comprising, a mounting block member having an axial bore extending therein, a wear collar member disposed for detachably mounting on said block member, a flexible retainer ring element disposed for snap-action co-acting engagement between said block member and said wear collar member for retaining the latter in generally stationary relationship relative to said block member, said wear collar member having an opening disposed in generally concentric relation relative to the bore in said block member and said opening being defined by an inwardly tapered peripheral surface defining a seat portion adapted for confronting surface-to-surface engagement with a generally complimentary shaped shoulder portion provided on said cutter bit to enable rotation of said cutter bit relative to said

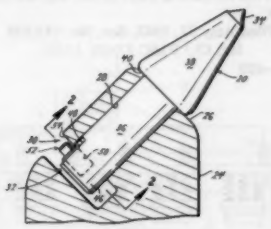
block member when disposed in said bore, and retainer means operably associated with said block member and said cutter bit to enable substantially free-rotation of said cutter bit within said bore and to prevent axial displacement of said cutter bit from within said bore, and wherein said collar member is of a generally circular configuration having an integral radial flange extending outwardly in a direction away from said tapered seat portion, and said flange being provided with annular groove means adapted to receive said flexible retainer ring element.

4,489,987

MINE TOOL BIT WITH SPRING LOADED BUTTON RETAINER

John E. Towers, 203 N. Victor, and Robert E. Edwards, 208 S. Jesse, both of Christopher, Ill. 62822

Filed Apr. 18, 1983, Ser. No. 485,719
Int. Cl.³ E21B *10/00*
U.S. Cl. 299—86 **15 Claims**



1. A mine tool having a cylindrical shank for rotable mounting in a block on a mining machine, said block having at least a partially open ended cylindrical bore in which the shank is rotably received and through which the end of the shank protrudes for access thereto, said mine tool including:

means defining a generally radially extending hole in the end of the shank which protrudes from the bore when mounted in said block;

an insert fixedly secured in said hole, said insert having a cylindrical button telescopically mounted therein; and,

means biasing said cylindrical button outwardly from the profile of the shank, said cylindrical button having an appreciable portion thereof extending beyond the insert, the block having a generally flattened surface against which the side of the button abuts to prevent inadvertent dislodging of the tool during use.

4,489,988

METHOD AND APPARATUS FOR PROVIDING A SEALED TRAILER WHEEL

Jerry L. Robbins, 21 Bowman Ct., Greenfield, Ind. 46140

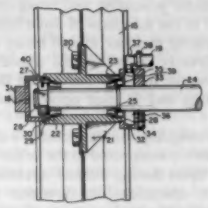
Filed Jun. 1, 1982, Ser. No. 383,827
Int. Cl.³ B60B *27/02*
U.S. Cl. 301—108 S **9 Claims**

1. An apparatus for providing a sealed trailer wheel assembly, the assembly including an axle, a hub mounted to the axle and received over two sets of bearings positioned between the axle and the hub to provide for rotation of the hub relative the axle, a grease seal, a nut threaded onto the end of the axle and secured thereto by a cotter pin to retain the hub on the axle, the hub including an inner flange and an outer flange, said apparatus comprising:

a water-proof cap sealingly mounted to the outer flange of the hub and enclosing the nut and the end of the axle;

air housing means for providing a substantially sealed enclosure of the space between the inner flange of the hub and the axle, said air housing means including a housing extending adjacent to but spaced from the inner flange of the hub; and

air supply means for supplying pressurized air to the enclosure defined by said air supply housing at a rate sufficient to prevent water, sand and other contaminants from entering the enclosure through the spacing between the air supply housing and the inner flange of the hub.

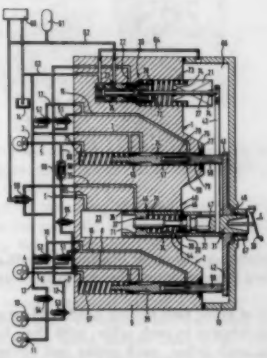


4,489,989

AUXILIARY POWER ASSISTED MASTER CYLINDER ARRANGEMENT FOR A VEHICLE BRAKE SYSTEM

Juan Belart, Walldorf; Jochen Burgdorf, Offenbach-Rumpenheim; Dieter Kircher, Frankfurt am Main; Helmut Steffes, Eschborn; Hans-Wilhelm Bleckmann, Obermoerlen, all of Fed. Rep. of Germany; André F. L. Goosens, Rumst; Willi van Kelst, Putte, both of Belgium, and Lutz Weise, Mainz, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 1, 1982, Ser. No. 394,371
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1981, 3131095
Int. Cl.³ B60T *13/14*
U.S. Cl. 303—92 **34 Claims**



1. A master cylinder arrangement for use in conjunction with an auxiliary source of pressurized fluid in a braking system, especially of a vehicle, for controlling the effective pressure of a hydraulic braking fluid in at least one braking circuit incorporating at least one brake actuating cylinder, in dependence on the position of a brake operating member, especially a brake pedal, comprising

at least one master cylinder unit, including means for bounding a master cylinder bore, and a master piston received in said master cylinder bore for axial movement therein and subdividing said bore into a primary compartment communicating in use with the braking circuit, and a secondary compartment;

a brake control valve unit interposed in use between the

auxiliary source and said secondary compartment and operative for controlling the pressure in the latter;

means for operating said brake control valve unit in dependence on the position of the brake operating member in use, including

a travel simulator preceding said brake control valve unit as considered in the direction of force transmission from the brake operating member to said brake control valve unit;

means for directly coupling said master piston with said operating means for joint movement therewith at least in said direction and at least upon failure of the auxiliary source;

wherein said coupling means includes a cylinder-and-piston unit operatively connected to the brake operating member and acted upon during normal operation with the auxiliary source operational in direction toward the brake operating member by a pressure derived from the auxiliary source, and a first mechanical link extending from said cylinder-and-piston unit to said master piston; wherein said operating means further includes a second mechanical link extending from said cylinder-and-piston unit to said travel simulator; and further comprising means for interlocking said mechanical links upon failure of the auxiliary source; and

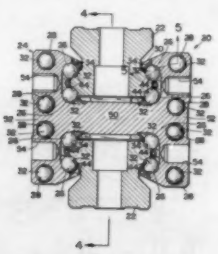
wherein said interlocking means is a hydraulic interlocking means.

4,489,990

RECIRCULATING-BALL LINEAR BEARING ASSEMBLY WITH A PAIR OF OPPOSED GUIDE RAILS

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed Apr. 12, 1983, Ser. No. 484,423
Claims priority, application Japan, Apr. 16, 1982, 57-63533
Int. Cl.³ F16C 29/06
U.S. Cl. 308—6 C **11 Claims**



1. Recirculating-ball linear bearing apparatus capable of well withstanding the load acting thereon in any direction, comprising:

(a) a pair of guide rails having heads and arranged in parallel spaced relation to each other, with their heads held opposite to each other, each guide rail having two pairs of parallel spaced raceways of arcuate cross section formed longitudinally on both sides of its head, each pair of raceways being angled away from each other;

(b) a bearing body of substantially H-shaped cross section integrally comprising a web disposed between the pair of guide rails and a pair of side flanges on both sides of the guide rails, the bearing body having formed longitudinally on inner surfaces thereof four pairs of raceways of arcuate cross section arranged in opposed relation to the four pairs of raceways on the guide rails, the bearing body also having a return passageway extending longitudinally therethrough in the vicinity of each raceway thereon;

(c) a pair of end covers secured to the opposite ends of the bearing body and each having formed therein a plurality of hairpin grooves each intercommunicating one raceway on the bearing body and one adjacent return passageway in the bearing body;

(d) groups of antifriction balls rollably interposed between the raceways on the guide rails and the raceways on the bearing body, each group of antifriction balls being capable of recirculation through a closed path comprising one raceway on the bearing body, one adjacent return passageway in the bearing body, and two of the hairpin grooves in the end covers; and

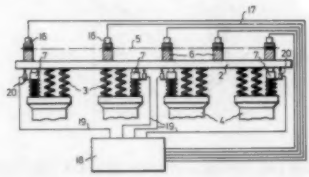
(e) cage means mounted in fixed relation to the bearing body for rollably holding the antifriction balls against displacement as they roll between the raceways on the guide rails and the raceways on the bearing body.

4,489,991

ELASTIC SUPPORT FOR MACHINES

Heinz Delam, Berlin, Fed. Rep. of Germany, assignor to GERB Gesellschaft für Isolierung mbH & Co. KG, Berlin, Fed. Rep. of Germany

Filed Aug. 31, 1982, Ser. No. 413,535
Int. Cl.³ F16C 27/00, 35/00
U.S. Cl. 384—428 **14 Claims**



1. A method for alignment of shafts disposed on an elastic or flexible base plate comprising sensing continuously the quietness of the running of a shafting arrangement of a machine positioned on the base plate supported by way of a spring element requiring a support force;

ascertaining the state of the solid connection between bearing element and base plate with a measurement device; determining the state and size of support force changes in the spring element;

resetting a hydraulic adjustment device incorporated into the spring element for the support force of the spring element disposed below the base plate depending on deviations from a set point observed by the sensing until the set point has been reached again and for changing the support conditions of the base plate;

disengaging an existing solid connection between the base plate and the spring element for the resetting process; setting the adjustable element; and

providing again said solid connection.

8. A vibration damping adjustable support for machines comprising

a base plate for supporting elastically a machine; a bearing element disposed below the base plate for supporting the base plate;

a hydraulic adjustment device incorporated into the bearing element for changing the supporting condition of the bearing element;

mounting means including an adjustable wedge connection for providing a solid connection between the base plate and the bearing element; and

a measurement device for ascertaining the state of the solid connection between bearing element and base plate and for determining the state and size of support force changes in the bearing element.

4,489,992

SELF-ALIGNING BEARING

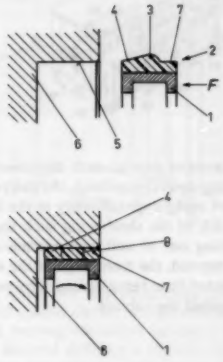
Manfred Brandenstein, Eussenheim; Horst M. Ernst, Eltingshausen; Lothar Walter, Schweinfurt, and Karl-Friedrich Kaschube, Niederwerrn, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 19, 1981, Ser. No. 312,895

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1980, 3039422; May 23, 1981, 3120608

Int. Cl.³ F16C *23/08, 27/00, 35/07*

U.S. Cl. 384—496 17 Claims



1. In a self aligning bearing structure wherein said bearing structure has an outer ring, and a plastic outer jacket is provided on said ring and adapted to be received in a bearing seat of a housing, said bearing seat being cylindrical, the improvement wherein said plastic outer jacket is of an elastically yielding plastic material and is fixedly connected to said outer ring, said plastic outer jacket having a single radially extending annular ridge in contact with said seat, said ridge being located at one axial portion thereof, said ridge having a larger outer diameter than the remainder of said jacket, and said ridge being compressed substantially to the compression limit of said plastic material between said outer ring and said cylindrical bearing seat.

4,489,993

CRT MOUNTING STRUCTURE

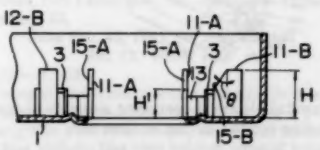
Hiroshi Hasegawa; Yoshitaka Tsutsui; Yoshinori Horikawa, and Seii Miyakawa, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 15, 1982, Ser. No. 388,613

Claims priority, application Japan, Jun. 17, 1981, 56-92325

Int. Cl.³ A47B *81/06*

U.S. Cl. 312—7.2 3 Claims



1. A CRT mounting structure for inserting and fixing a CRt to a cabinet having a substantially rectangular opening for exposing a front panel of the CRT, the CRT mounting structure comprising:

at least four mounting seats provided on an inside of said cabinet adjacent to four corners of said opening for respectively mounting the CRT;

a plurality of reinforcement bosses provided on the inside of the cabinet, said reinforcement bosse; being respectively disposed near both sides of each of said mounting seats and being respectively integrally connected through a reinforcement rib to the respective mounting seats;

guide ribs provided on the inside of said cabinet along two edges of said opening, each of said guide ribs includes an upright portion and an upper surface portion tapering in a direction toward an outside of the cabinet, a height of said upright portion of each of said guide ribs is substantially equal to or greater than a height of said mounting seats;

guide posts provided on the inside of the cabinet along edges of said opening opposite to said adjacent two edges along which said guide ribs are provided, a height of each of said guide posts is substantially equal to or greater than the height of the guide ribs.

4,489,994

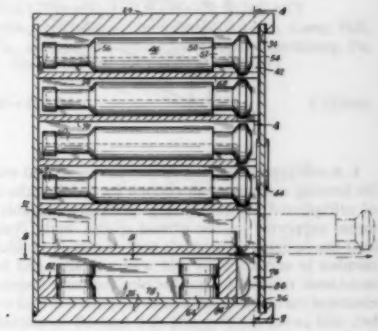
PUNCH AND DIE STORAGE BOXES

Barry E. Williams, 8200 Boulevard East, North Bergen, N.J. 07047

Filed Mar. 14, 1983, Ser. No. 475,153

Int. Cl.³ A47F *3/14*

U.S. Cl. 312—119 8 Claims



1. In combination, for use in a tabletting machine in which a series of operations are performed in the compacting of a powder to form tablets:

(A) a stored set of matching dies and punches, there being two punches for each die, the stored set of matching dies and punches being interchangeable with other sets of matching sets of dies and punches for the manufacture of different sizes, shapes and weights of tablets,

(i) each die being squat and having a circular bore,

(ii) each punch being elongated and including a cylindrical barrel many times longer than a die, each barrel terminating in a neck which carries an enlarged mushroom head, the other end of the barrel having a second neck which is longer than the neck on which the mushroom head is secured, the second neck terminating in a smaller head designed to match with a bore in the die to be received therein in a sliding fit; and

(B) a storage cabinet in which the set of matching dies and punches are received, said storage cabinet comprising plural, horizontal storage trays with their fronts in vertical registration, means to slideably support said trays in stacked horizontal positions, each storage tray containing plural elongated, horizontal nests for supporting the barrels of said punches, each nest having a front edge located within the cabinet, the mushroom heads of said punches overhanging said trays and being disposed within said cabinet, said nests having upstanding sides for restricting

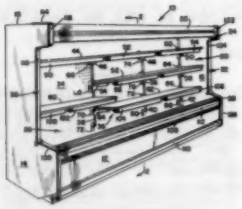
movements of the punches against lateral shifting of the punches, said cabinet having a front wall, said front wall and the front edges of the nests cooperating with the mushroom heads to restrict axial movement of the punches while preventing contact of the smaller heads of the punches with the wall of the cabinet opposite the front wall of the cabinet, said tray supporting means permitting movement of the trays relative to one another in a manner such as to provide access to individual punches in the trays for withdrawal therefrom for insertion into the tabletting machine or for placement of individual punches withdrawn from the machine into the trays, and a further horizontal tray in the cabinet in which the dies are disposed.

4,489,995

ADJUSTABLE ELECTRICAL OUTLET ASSEMBLY

Roger W. Barr, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Filed Aug. 14, 1981, Ser. No. 292,949
Int. Cl.³ A47B 77/08; A47F 3/04
U.S. Cl. 312—236 **12 Claims**



1. A refrigerated display cabinet having spaced walls therein for forming at least one air conduit for enabling the circulation of refrigerated air and having vertically movable assembly means supported by one of said spaced walls, comprising at least one opening formed in a wall of said air conduit, a cover member in contact with said wall and arranged for vertical movement relative to and for blocking said opening, and an electrical current take-off means supported in said cover member, said cover member and said take-off means substantially flush with the side of said wall on which said assembly means is supported and means for securing said cover member in variable vertical positions relative to said opening for enabling said current take-off means to be used at different vertical positions to avoid blockage of said take-off means by said vertically movable assembly means.

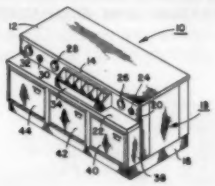
4,489,996

CABINET WITH AN EXTERNAL SHELF AND CUP DISPENSER

Terry L. Norton, Royston, and Neil V. Constantine, Hartwell, both of Ga., assignors to Royston Manufacturing Corporation, Royston, Ga.

Filed Aug. 23, 1982, Ser. No. 410,561
Int. Cl.³ A47F 3/02
U.S. Cl. 312—279 **1 Claim**

1. A storage cabinet for use in self-service convenience stores and the like comprising a cabinet enclosure providing a storage space, the cabinet enclosure including a horizontal counter top above the storage space forming a top for the storage space, a front wall having an upper edge and openable means for providing access to the storage space, and at least one cup dispenser, each cup dispenser comprising a supply tube extending horizontally underneath the counter top in close proximity thereto, wherein each cup dispenser has a cup delivery opening spaced rearwardly with respect to the front wall of the cabinet, the counter top has a front edge also spaced rearwardly with respect to the front wall of the cabinet, and the front structure of the cabinet includes a panel extending vertically downwardly from the front edge of the counter top and terminating in a lower edge and a horizontal shelf extending forwardly from the lower edge of said panel to the upper edge of the front wall, the panel has an opening corresponding to each cup dispenser, each cup dispenser contains a supply of cups within its supply tube, the supply of cups in each cup dispenser extends through the corresponding opening in the



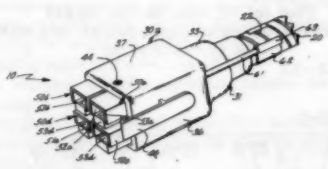
panel, and the foremost cup in each dispenser projects forwardly from the cup delivery opening, the delivery opening of each cup dispenser being approximately at the location of the panel and the width of the shelf being such that the furthest forwardly projecting one of said cups extends almost to, but does not project beyond, the front edge of the shelf, whereby the cups are protected from being damaged by persons walking past or leaning against the cabinet.

4,489,997

ELECTRICAL CONNECTOR

Norman R. Byrne, Ada, Mich., assignor to Stow & Davis Furniture Company, Grand Rapids, Mich.

Filed Mar. 15, 1982, Ser. No. 358,092
Int. Cl.³ H01R 15/00, 4/66
U.S. Cl. 339—13 **24 Claims**

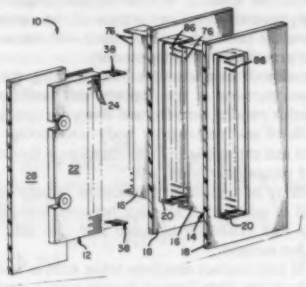


1. A grounded electrical connector assembly comprising:
a conductive conduit having an open end;
a connector housing molded onto said conduit, said housing defining a chamber communicating with said conduit;
grounding means extending through said housing, said grounding means including a first end within said chamber and a second end outside of said chamber; and
means for electrically connecting said second grounding means end to said conduit.

4,489,998
BUSSING CONNECTOR SYSTEM

John C. Asick, Harrisburg; George H. Douty, Mifflintown; Joseph R. Goodman, Lake City; Kermit M. Jones, Jr.; John M. Landis, both of Camp Hill; Clair W. Snyder, Jr., York; John A. Woratyla, Camp Hill, and Dale R. Zell, Elizabethtown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 1, 1982, Ser. No. 437,997
Int. Cl.³ H01R 25/16
U.S. Cl. 339—17 LM 15 Claims



1. A bussing system for interconnecting circuits on pairs of adjacent parallel spaced circuit boards, comprising:

an elongated bussing connector having a housing of rigid insulative material defining a plurality of parallel spaced profiled slots inwardly directed from a mating face, each slot including a groove on each opposite side face of the connector extending away from the mating face in parallel spaced fashion, a plurality of receptacle terminals each mounted in a respective slot and each having a cross bar portion and a pair of parallel spaced contact legs lying in respective grooves; and

a connector assembly on each circuit board comprising a pin header and a pin shroud mounted on opposite sides of a mating edge portion of each said circuit board, each said pin header and said pin shroud having a housing of rigid insulative material with a plurality of terminal passages extending therethrough, each passage aligned with a respective conductive aperture in said circuit board, a like plurality of pin terminals each extending through respective ones of said passages and conductive aperture to project from both oppositely directed mating faces of said pin header and pin shroud whereby receptacle terminals of a bussing connector engaging the terminal pins extending from the mating face of a pin header of a first circuit board and a pin shroud of a second circuit board busses together the circuits of said first and second circuit boards.

4,489,999
SOCKET AND FLEXIBLE PC BOARD ASSEMBLY AND METHOD FOR MAKING

Jay J. Miniet, Fort Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

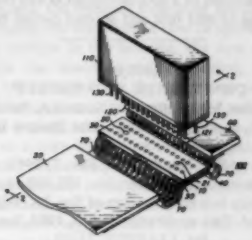
Filed Feb. 15, 1983, Ser. No. 466,467
Int. Cl.³ H01R 9/09
U.S. Cl. 339—17 CF 8 Claims

1. An integral interconnect socket and flexible board assembly for accepting an electronic module having a plurality of leads arranged in a predetermined pattern, said assembly comprising:

a flexible printed circuit (PC) board having a plurality of conductors and a first set of holes disposed to respectively intersect said conductors;

a substantially rigid platform mounted to and solely supported by said PC board and having a second set of holes, said first and second set of holes being in alignment to define common apertures arranged in said predetermined pattern to receive said leads;

means for forming electrically conductive areas within said apertures and making electrical connections with the respective conductors;



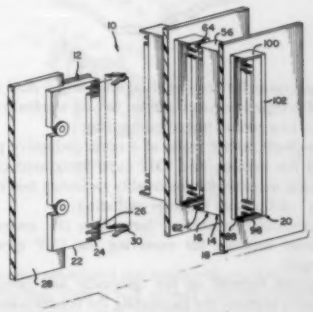
a jack means mounted to each aperture for receiving said leads and making electrical connections between said conductive areas and said leads; and

means for keying said platform to inhibit the misaligned insertion of said leads of the module into said apertures.

4,490,000
MULTI-PLANE CROSSOVER CONTACT

John C. Asick, Harrisburg, and John M. Landis, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 23, 1983, Ser. No. 478,017
Int. Cl.³ H01R 25/16
U.S. Cl. 339—17 LM 4 Claims



1. A bussing system for interconnecting in stepped or crossover fashion circuits on pairs of adjacent parallel spaced circuit boards, comprising:

an elongated bussing connector having a housing of rigid insulative material defining a plurality of parallel spaced profiled slots inwardly directed from a mating face, each slot including a groove on each opposite side face of the connector extending away from the mating face, with planes defined by the grooves being parallel and stepped apart, and an oblique channel at said mating face connecting said grooves, a plurality of crossover terminals each mounted in a respective slot and each having a cross bar portion lying in said channel and a pair of parallel spaced contact legs lying in respective grooves; and

a connector assembly on each circuit board comprising a pin header and a pin shroud mounted on opposite sides of a mating edge portion of each said circuit board, each said pin header and said pin shroud having a housing of rigid insulative material with a plurality of terminal passages extending therethrough, each passage aligned with a respective conductive aperture in said circuit board, a like

plurality of pin terminals each extending through respective ones of said passages and conductive aperture to project from both oppositely directed mating faces of said pin header and pin shroud whereby crossover terminals of a bussing connector engaging the terminal pins extending from the mating face of a pin header of a first circuit board and a pin shroud of a second circuit board busses together the circuits of said first and second circuit boards.

4,490,001

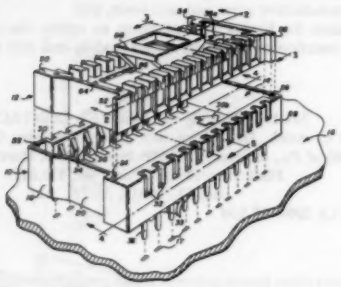
DIP CARRIER AND SOCKET

Ronald F. Gordon, Mill Valley, and Ronald A. Smith, Los Gatos, both of Calif., assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 464,647, Feb. 7, 1983, abandoned, which is a continuation of Ser. No. 183,383, Apr. 8, 1980, abandoned, which is a continuation of Ser. No. 001,226, Jan. 5, 1980, abandoned. This application Feb. 3, 1984, Ser. No. 576,176

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—17 CF **1 Claim**



1. Apparatus for removably connecting a dual in-line package (DIP) type integrated circuit having a plurality of conductive legs to a circuit board comprising:

a one-piece carrier made of a semiconductive plastic material for holding said DIP type integrated circuit and a socket member for removably receiving said carrier member, said carrier member including:

a DIP-receiving portion formed in the underside of the carrier member for receiving the DIP type integrated circuit,

a pull-tab formed on the underside and centrally of the carrier member for facilitating the insertion and separation of said carrier member to and from said socket member, said pull-tab including flanges formed on the opposite longitudinal sides thereof, said pull-tab further formed with recesses in the top and bottom thereof to provide a relatively thin web having a rectangular opening therein for insertion of an auxiliary lifting tool,

a plurality of parallel spaced ribs extending generally between the underside and upperside of said carrier member along opposite sides thereof forming slots between adjacent ribs for receiving the individual conductive legs of the DIP type integrated circuit, wherein the space between said slots is sufficiently small so that the recessed DIP legs are prevented from being touched by a person handling said carrier,

a beam extending generally perpendicular to the direction of said ribs for holding said conductive legs and securing the DIP type integrated circuit in the DIP receiving portion,

a web connected to said beam, said web including a recess cooperatively positioned relative to the flanges on said pull-tab to provide additional clearance between the flanges and the web to facilitate gripping of the pull-tab and the insertion and separation of the carrier member to and from socket member,

at least one key portion formed on the peripheral surface of the carrier member, which are in substantial alignment with the vertical reaches of said adjacent ribs and

said socket member including a one-piece rectangular body and a plurality of contact members for engaging said conductive legs when the carrier member is inserted in the socket member, said rectangular body having:

a carrier-receiving cavity defined by two side walls, two end walls and a bottom wall for receiving said carrier member,

at least one keyway portion formed in the inner surface of one of the walls of said carrier-receiving cavity for matingly receiving said key portion of the carrier member to allow the carrier member to mate with the socket member in a preselected orientation only,

a plurality of exterior slots formed along the outside and upper portions of the opposite side walls, a plurality of interior parallel slots formed along the opposite inner side walls of said rectangular body intersecting said exterior slots and extending to form openings in the bottom wall of said rectangular body, and

a plurality of transverse projections formed on the bottom wall of said socket member between said adjacent openings and extending between said two side walls of the socket member,

each of said contact members being held in said rectangular body in the slots formed therein with a pronged portion projecting outwardly through the opening in the bottom wall of the rectangular body formed by said interior slot for engaging said circuit board, and

a resilient portion extending into said carrier receiving cavity of the rectangular body for engaging said conductive leg of the DIP type integrated circuit.

4,490,002

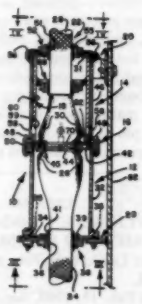
RELEASABLE CABLE CONNECTOR ASSEMBLY FOR USE BETWEEN A MOBILE AND STATIONARY OBJECT

Orren V. Fowler, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 1, 1982, Ser. No. 445,887

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—45 M **9 Claims**



1. A cable connector assembly for releasably securing together a pair of cable portions of a cable, comprising:

stationary means for fixedly securing therein one of said cable portions during release of said pair of cable portions from one another;

means releasably slidable within said stationary securing means for fixedly securing thereto the other of said cable portions;

means releasably connected to said stationary securing means for fixedly securing said other of said cable portions

directly thereto, said means releasably connected to said stationary securing means including a cover-like element and at least one shearable element for releasably connecting said cover-like element to said stationary securing means, said cover-like element capable of being released from said stationary securing means when said shearable element is subjected to a preselected amount of force sufficient to cause said element to shear; and

means included as part of said stationary securing means and said releasably slidable means for releasably connecting said one cable portion to said other cable portion;

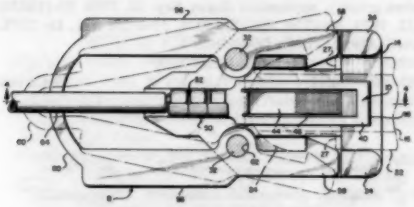
whereby, upon the application of said preselected amount of force to said shearable element through said cover-like element and said other cable portion, substantially simultaneously said cover-like element is released from said stationary means, said releasably slidable means is withdrawn from said stationary means and said pair of cable portions disconnect from one another.

4,490,003

ELECTRICAL CONNECTOR

Earl F. Robinson, Batavia, Ill., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Jan. 11, 1982, Ser. No. 338,358
Int. Cl.³ H01R 9/11
U.S. Cl. 339—75 MP **9 Claims**



1. An electrical connector comprising an electrically insulated housing having a cavity and an opening providing communication from the cavity to the exterior of the housing, an electrical terminal within said cavity and having a first end presented toward said opening for receiving and contacting an electrical conductor projecting through said opening, a lead wire electrically connected to the second end of said terminal and extending from said housing, and means for releasably retaining said conductor in said housing and in contacting relationship with said terminal; said means comprising at least one jaw member pivotally mounted on said housing and movable from a conductor-retaining position to a conductor-release position at which the conductor can be inserted into or withdrawn from the housing through said opening to make or break contact with said terminal, and resilient means biasing said jaw member to said conductor-retaining position, said resilient means comprising a U-shaped length of wire one end of which is affixed to said jaw member, and a strain relief member molded over said lead wire with a segment of the return bend portion of the U-shaped wire embedded in said strain relief member for transmittal of strain from the lead wire to said U-shaped wire providing said resilient means.

4,490,004

CONNECTOR FOR CONNECTING INSULATED WIRES TO A CIRCUIT BOARD

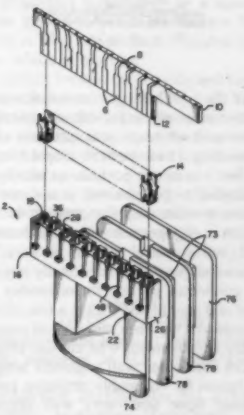
John T. Lawrence, and John C. Swartz, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 11, 1982, Ser. No. 407,011
Int. Cl.³ H01R 11/01
U.S. Cl. 339—95 R **6 Claims**

1. A multi-contact electrical connector for connecting wires to the terminal pads on a circuit board, the terminal pads being arranged in a row which extends along one edge of the circuit board, the connector being of the type comprising an insulating housing having a board-receiving face and a rearward face, first and second sidewalls extending between the faces and endwalls at the ends of the housing extending between the faces, a trough-like board-receiving opening extending into the board-receiving face which is dimensioned to receive the one edge of the board, the opening extending parallel to the sidewalls and between the endwalls, a row of spaced-apart terminal-receiving cavities in the housing, the row of cavities extending beside the board-receiving opening, and terminals dimensioned to be received in the terminal-receiving cavities, each terminal having a wire connecting end and a contact end, each terminal having wire connecting means for connecting the terminal to a wire at its wire-connecting end and having contact means at its contact end for contcting a terminal pad on the circuit board, the connector being characterized in that:

the terminal-receiving cavities extend into the housing from the board-receiving face and have inner ends which are proximate to the rearward face of the housing,

circuit board stop means are provided in the board-receiving opening for engagement by the one edge of the circuit board, the circuit board stop means being located between the inner ends of the terminal-receiving cavities and the board-receiving face of the housing,



each cavity has associated therewith aligned first and second wire-admitting slots which extend into the housing from the board-receiving face, the first and second wire-admitting slots extending inwardly from the first and second sidewalls respectively, wire stop means for locating wires in the slots, the wire stop means being between the inner end of the cavity and the circuit board stop means whereby a wire can be moved laterally of its axis towards the board-receiving face and into the wire-admitting slots and will extend through the associated cavity at a location between the inner end of the cavity and the circuit board stop means,

each cavity having opposed cavity walls which extend in planes that extend normally of the board-receiving face and normally of the housing sidewalls, the opposed cavity walls having grooves therein,

each terminal comprising at least one plate-like sheet metal member having side edge portion extending from the contact end to the wire-connecting end, the contact means comprising a leaf spring which is integral with, and extends from, the contact end of the terminal and is formed from portions of the plate-like member which are between the side edge portions,

the wire connecting means on each terminal comprising a

wire-receiving slot extending inwardly in the terminal from the wire-connecting end whereby,

upon placement of the wires in the wire-admitting slots and insertion of a terminal into each of the cavities, wire-connecting end first, the side edge portions of the plate-like member will be received in the grooves and the wires will be received in the wire-receiving slots and thereby connected to the terminals, and upon insertion of the one edge of the circuit board into the board-receiving opening, the contact means of the terminals will contact the terminal pads on the circuit board.

4,490,005

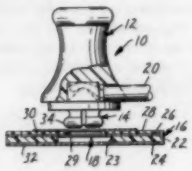
ELECTRICAL CONNECTOR

Dean L. Hovey, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jun. 21, 1982, Ser. No. 390,367

Int. Cl.³ A61B 5/04; H01R 4/52

U.S. Cl. 339—278 C **1 Claim**



1. In a stud of the type having a central axis and comprising a non conductive substrate and a thin electrically conductive outer layer over said substrate, said substrate and conductive outer layer providing a base portion adapted to be connected to a part of a first connector portion, an axially spaced distal end portion adapted to be received in a socket defined in a second connector portion with the conductive outer layer on said distal portion in engagement with a conductive wall defining said socket, and a central portion between said base and distal end portions adapted to be frictionally engaged by means in said second connector portion for releasably retaining said distal portion of said stud in said socket while affording relative rotation about said axis between said second connector portion and said stud, the improvement wherein said central portion of the stud includes first outer wall segments adapted to be engaged by said means for releasably retaining and second wall segments recessed from said outer wall segments and the means for releasably retaining, said second wall segments extending from said distal end portion to said base portion to retain electrical continuity therebetween despite abrasion of said conductive outer layer from said outer wall segments in said central portion by said means for releasably retaining.

4,490,006

CENTERING PIECE FOR A PRECISION JUNCTION FOR OPTICAL FIBRES

Lars R. Lidholt, Skogsmyrsvägen 4 A, S-752 45 Uppsala, Sweden

PCT No. PCT/SE81/00233, § 371 Date Apr. 19, 1982, § 102(e) Date Apr. 19, 1982, PCT Pub. No. WO82/00720, PCT Pub. Date Mar. 4, 1982

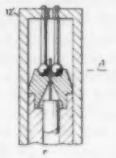
PCT Filed Aug. 21, 1981, Ser. No. 375,125

Claims priority, application Sweden, Aug. 21, 1980, 8005871

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.20 **11 Claims**

1. Centering piece having means for mounting in a connector member for optical fibres, for centering and fixing the position of an end of an optical fibre in a center hole in the centering plane, said centering piece (5) consisting of a body rotatable about an axis coinciding with said center hole (8) and having in one direction a stiff frusto-conical exterior surface (14), the exterior conical surface of which, by virtue of the fact that it is centered in relation to the axis, acts as a support and fitting surface against an interior conical surface fitting thereon in another connector member, centering means beir g arranged



to center said optical fibre (20) in the middle of said axis of the rotatable body.

4,490,007

OPTICAL FIBER ALIGNMENT MECHANISM AND CONNECTORS USING THE SAME

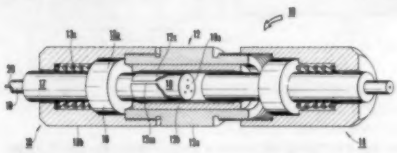
Hisashi Murata, Ibaraki Prefecture, Japan, assignor to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

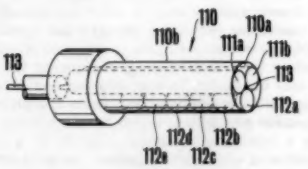
Filed Sep. 18, 1979, Ser. No. 76,779

Claims priority, application Japan, Sep. 20, 1978, 53-116220; Jan. 22, 1979, 54-4728; Jan. 22, 1979, 54-4729; Apr. 16, 1979, 54-46440; Apr. 23, 1979, 54-48930

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.21 **37 Claims**





1. An optical fiber connector and alignment mechanism comprising at least an optical fiber; at least three rigid members each having a circular cross section with wear resistant surfaces and arranged to surround said optical fiber and with each being in tangential contact with said optical fiber and with two other rigid members; a connector body having internal wear resistant surfaces and a molded plastic member containing said fiber and rigid members in an integral molded plug-like shape having an exterior configuration complementary to the interior configuration of the connector body for interconnecting two such mechanisms with their optical fibers in axial alignment; the outer surface of said molded plastic member being open at a number of points completely around the periphery thereof to allow the surface of said rigid members to be exposed tangentially at least at three arcuately displaced portions completely around the periphery of the molded plastic member for engaging the complementary interior surface of the connector body whereby the contacting complementary surfaces of said rigid members and said connector body are wear-resistant and main-

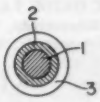
tain proper alignment of the optical fibers even after many connect-disconnect operations.

4,490,008

INFRARED FIBERS

Kazuhito Murakami, and Kenichi Takahashi, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 26, 1982, Ser. No. 436,688
Claims priority, application Japan, Nov. 9, 1981, 56-178399
Int. Cl.³ D02G 3/00; G02B 5/14
U.S. Cl. 350—96.34 5 Claims



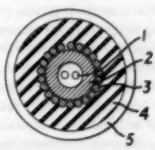
1. An infrared fiber comprising a core consisting of a mixed crystal containing 0.01 to 10% by weight of silver chloride in silver bromide and a cladding consisting of a mixed crystal containing 0.01 to 10% by weight of silver bromide in silver chloride.

4,490,009

OPTICAL FIBER SUBMARINE CABLE

Taiichiro Nakai, Fujisawa; Kahei Furusawa, Kamifukuoka; Masanori Sato, Machida; Yasuhiko Niiro, Yokohama; Yoshihiro Ejiri, Tokyo, and Makoto Nunokawa, Kawasaki, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 069,553, Aug. 24, 1979, abandoned.
This application Aug. 16, 1982, Ser. No. 408,160
Claims priority, application Japan, Aug. 30, 1978, 53-104869
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.23 4 Claims



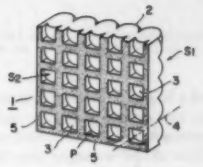
1. An optical fiber repeatered submarine cable comprising: at least one coated optical fiber defining a signal path in the cable; a pressure-resisting, electrically-conductive fluid-tight, coreless, tubular layer having a tubular geometry with an inner diameter and an outer diameter selected dimensionally with a relationship selected to define a selected dimensional cross-section and thickness of the tubular layer to withstand a high hydraulic pressure while submerged in deep seas and simultaneously effective to allow relative optimum conduction of direct current for use thereof as a power-supplying feeder, the pressure-resisting layer having a conduit shaped configuration defining a central axial housing space protectively enclosing and housing the coated optical fiber extending longitudinally therein; an electrically-conductive, tension-resisting wire layer made of a material having relatively low electrical conductivity lower than the electrical conductivity of the material of said pressure-resisting layer functioning as said power-supplying feeder and disposed in close contact circumferentially and axially with the outermost surface of said pressure-resisting layer for effectively attenuating surges of high voltages like a pulse including high frequency components transmitted on an outer surface thereof by skin effect; and an insulator layer disposed around said tension-resisting wire layer and axially thereof.

4,490,010

REAR PROJECTION SCREEN

Makoto Honda, Kamifukuoka; Akira Izawa, Kawasaki, and Yutaro Moriguchi, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,463
Claims priority, application Japan, Jun. 10, 1982, 57-99692; Oct. 15, 1982, 57-180790; Dec. 3, 1982, 57-183175
Int. Cl.³ G03B 21/60
U.S. Cl. 350—128 6 Claims



1. A rear projection screen used as a screen of television systems or the like to form images thereon by rays of light projected from at least one projector located in a rear position of the screen, which comprises:

a first lens surface formed on one side and having an array of a plurality of convex lenses;

a second lens surface formed on the other side and having an array of a plurality of convex lenses whose axes are substantially in line with those of the convex lenses of said first lens surface; and

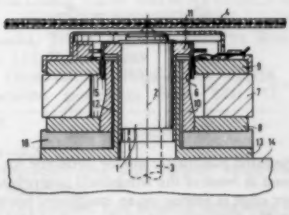
light masking layers formed on projections or raised portions which are projected so as to surround each of convex lenses of the second lens surface and which are extended forwardly of said second lens surface.

4,490,011

OPTICAL DEVICE

Roger J. E. Houbregs, and Eduard Camerik, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1982, Ser. No. 437,387
Claims priority, application Netherlands, Jun. 17, 1982, 8202451
Int. Cl.³ G07B 7/04
U.S. Cl. 350—255 6 Claims



1. An optical device comprising:

a frame;

an axially movable objective with an optical axis;

a parallel guide arrangement for the axial guidance of the objective; and

an electromagnetic actuating device for said objective, which device comprises a first actuating means connected to said objective and a second actuating means arranged

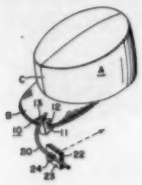
on said frame, said first and second actuating means axially co-operate with each other in an air gap with a magnetic field which is oriented transversely of said optical axis, characterized in that an axially resilient damping means is arranged between said frame and at least a part of said second actuating means for damping the axial forces exerted on said frame by said part of said second actuating means.

4,490,012

SAFETY REAR VIEW MIRROR DEVICE

David M. Magiske, R.D.#3 - Box 312, Monongahela, Pa. 15062

Filed Apr. 14, 1983, Ser. No. 484,879
Int. Cl.³ G02B 7/18
U.S. Cl. 350—637 **13 Claims**



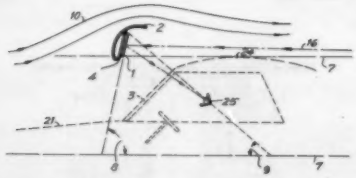
1. A safety rear view mirror device to be detachably secured to either a substantially vertical crown portion or a substantially horizontal brim portion of a head covering, which comprises, a detachable mounting base part having a leg portion for removably securing said base part on the head covering, a lengthwise-extending adjustably hand-bendable position-retaining connector cable, a mirror having a back mounting therefor, means lengthwise adjustably securing said connector cable between said mounting base part and said back mounting; said connector cable having a hollow sheath enclosing a ductile core extending therealong, and said cable being characterized by its ability to be repeatedly bent into a desired shape without breakage and to retain such shape without memory for supporting said mirror thereon in a desired back-viewing aligned position.

4,490,013

ELONGATED PANORAMIC MIRROR DEFLECTOR

Milan Pribis, 83-45 Broadway, Elmhurst, N.Y. 11373

Filed Apr. 20, 1982, Ser. No. 370,287
Int. Cl.³ G02B 5/08, 5/10; A47F 7/14; A47G 1/16
U.S. Cl. 350—632 **2 Claims**



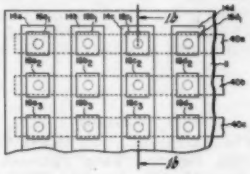
1. An elongated panoramic mirror deflector for an automobile positioned in front of the windshield comprising: A mirror whose lower edge is resting on an imaginary horizontal plane that touches the highest point of the roof of said automobile, the upper edge of said mirror being visible to the driver's eye through the windshield of said automobile along a line of sight at an angle of 45 degrees or less to the horizontal, said mirror being positioned such that its plane is at an angle of 70–80 degrees to the horizontal so that an optical axis passing over the roof of said automobile is reflected from said mirror through the windshield into the driver's eye, said mirror extending substantially the entire width of said windshield; a deflector comprising a sheet of material having a flat portion attached to the rear side of said mirror opposite said windshield and said driver and a curved portion extending from the bottom of said flat portion and being folded up, around and over said flat portion and said mirror so as to form a convexly curved shape facing the direction of travel of said automobile thereby diminishing the aerodynamic drag of said mirror and, by diverting the airstream toward the body of said automobile, lowering the total drag and improving the milage of said automobile.

4,490,014

LIQUID CRYSTAL DISPLAY WITH LOW CAPACITANCE ZINC OXIDE VARISTOR

Lionel M. Levinson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 037,873, May 10, 1979, abandoned. This application Feb. 11, 1981, Ser. No. 233,423
Int. Cl.³ G02F 1/133; H01C 7/10; H01B 1/08; H01L 29/12
U.S. Cl. 350—334 **9 Claims**



1. In a multiplexible matrix display including a plurality, N, of elongated, non-intersecting column electrodes and an N×M array of reflective display electrodes arranged behind and in registration with said column electrodes and further including a layer of optically active material display electrodes, said optically active material having a light transmissivity dependent on the voltage between said column and said display electrodes, each of said display electrodes being adjacent and connected to a first portion of a slab of nonlinear zinc oxide based varistor material comprising zinc oxide grains separated by layers of insulating intergranular material, a second portion of said slab having disposed thereon in electrical contact therewith M elongated, non-intersecting row electrodes extending in a direction substantially transverse to said column electrodes and further being in registration with said display electrodes, said varistor material exhibiting a dielectric constant ϵ and a breakdown field, F_1; the improvement in which:

said varistor material consists of between 2 mole percent and 8 mole percent Sb_2O_3, a quantity of Bi_2O_3 selected so that the mole percentage of Sb_2O_3 is more than twice the mole percentage of Bi_2O_3, at least one other material selected from the group consisting of Co_2O_3, MnO_2, NiO, Cr_2O_3, $BaCO_3$ and H_3BO_3 and the balance being ZnO.

4,490,015

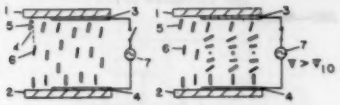
LIQUID CRYSTAL COLOR DISPLAY PANEL

Hiroshi Kawarada, Hirakata; Toshio Tatsumichi, Ando; Yasuo Wakahata, Katano; Mitsuyoshi Hamanaka, Kadoma, and Tamotsu Kajitani, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 25, 1982, Ser. No. 381,909
Claims priority, application Japan, May 25, 1981, 56-79653
Int. Cl.³ G02F 1/13, 1/133; C09K 3/34
U.S. Cl. 350—340 **11 Claims**

1. A liquid crystal color display panel including two transparent electrode-mounted substrates joined together with a gap therebetween, a displaying material composed of a system formed by dissolving optically active materials (chiral compounds) and dichroic dyes in nematic liquid crystals having negative dielectric anisotropy, the displaying material being

enclosed in said gap for utilization of a change in the degree of light absorption of said displaying material upon application of a voltage across the electrodes, said display panel comprising one of said substrates being such that it has been given tilted perpendicular alignment preparation so as to allow liquid crystal and dichroic dye molecules to be tilt-aligned, in the vicinity of said one substrate, in a given direction at a tilt angle



α meeting the relationship $0 < \alpha \leqq 4°$ relative to a normal line to said one substrate, the other of said substrates being such that it has been given perpendicular alignment preparation so as to allow liquid crystal and dichroic dye molecules to be aligned, in the vicinity of said other substrate, without tilting from a normal line to said other substrate, said displaying material being such that the relationship between its thickness d as a material layer and its helical pitch p is $d/p < 1$.

4,490,016

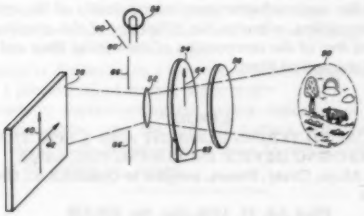
POLARIMETRIC IMAGE RECORDER

Irwin Schneider, Alexandria, Va., and Charles S. Guenzer, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1982, Ser. No. 395,431

Int. Cl.³ G02B *5/30, 27/18*; G11C *13/04*

U.S. Cl. 350—397 **12 Claims**



1. A polarimetric image recorder of a scene, comprising:

a layer of alkali halide material containing anisotropic color centers exhibiting photoinduced birefringence;

means for imaging two polarizations of light from the scene upon said layer, each said polarization exciting the same color centers in said layer; and

means for reading the polarization induced in said layer by said light.

4,490,017

HIGH-SPEED ZOOM LENS

Sadao Okudaira, and Shigetada Sato, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

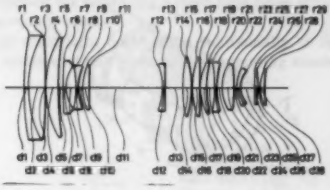
Filed Sep. 16, 1982, Ser. No. 418,970

Claims priority, application Japan, Dec. 22, 1981, 56-208727

Int. Cl.³ G02B *9/64, 15/18*

U.S. Cl. 350—427 **4 Claims**

1. A zoom lens comprising a first lens component having a positive refractive power, a second lens component haing a negative refractive power, a third lens component having a negative refractive power, and a fourth lens component having a positive refractive power, the first through fourth lens components being arranged in order from an object, in which said first lens component comprises a focusing lens component of a composite lens having a first negative lens and a second positive lens, and a third positive-meniscus lens, said second lens component comprises a variator lens composed of fourth and fifth negative lenses and a sixth positive lens mainly for varying magnification, said third lens component comprises a compensator lens component composed of a seventh negative lens



mainly for compensating for a variation of a focal point due to varied magnification, and said fourth lens component comprises a fixed master lens component composed of four or more positive lenses and two negative lenses with positive lenses disposed most closely to the object and an image, respectively, said bright zoom lens satisfying the following requirements:

$$5.5\,F_T > F_F > 4.8\,F_T \tag{1}$$

$$1.6\,F_T > |F_V| > 1.2\,F_T \tag{2}$$

$$1.4\,F_M > \frac{|F_{NA} + F_{NB}|}{2} > 0.7\,F_M \tag{3}$$

$$\frac{N_A + N_B}{2} > 1.78 \tag{4}$$

$$\nu_C > 50 \tag{5}$$

where

F_T: the focal length of the overall lens system when the focal length is minimum;

F_F: the focal length of the first lens component;

F_V: the focal length of the second lens component;

F_M: the focal length of the fourth lens component;

F_{NA}, F_{NB}: the focal lengths of the two negative lenses in the fourth lens component;

N_A, N_B: the refractive indices at the d-line of the two negatie lenses in the fourth lens component; and

ν_C: the Abbe number of third lens component or compensator lens component.

4,490,018

PHOTOGRAPHIC LENS WITH VARIABLE RANGE FOCUS ADJUSTMENT

Akio Yokotsuka, Tokyo, Japan, assignor to Kino Precision Industries, Ltd., Tokyo, Japan

Filed Nov. 10, 1982, Ser. No. 440,614

Claims priority, application Japan, Mar. 12, 1982, 57-33990[U]

Int. Cl.³ G02B *7/11*

U.S. Cl. 350—429 **33 Claims**

1. A photographic lens with variable range focus setting adjustment, comprising:

a generally cylindrical lens housing supporting at least one optical lens element for axial displacement therein to adjust the focus setting of the photographic lens;

a focus ring rotatable about said lens housing and operably coupled to displace said at least one lens element through a range of focus settings in response to focus ring rotation; and

a range stop assembly for limiting focus ring rotation to a prescribed range of movement relative to said lens housing to correspondingly limit the permitted range of focus

setting adjustment, said range stop assembly including a pair of circumferentially spaced end limits formed cooperatively between said lens housing and said focus ring, said end limits respectively defining the opposite ends of the prescribed range of focus ring rotational movement and including means for preventing focus ring rotation beyond

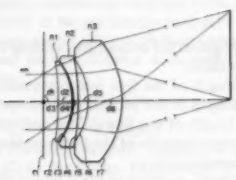
said prescribed range, said range stop assembly further including means accessible from the exterior of said focus ring for selectively altering the rotational position of one of said end limits to correspondingly alter the circumferential spacing between said end limits and thereby alter the permitted range of focus setting adjustment.

4,490,019

WIDE ANGLE COPYING LENS WITH HIGH APERTURE EFFICIENCY

Hiroichi Shinohara, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Oct. 22, 1982, Ser. No. 436,064
Claims priority, application Japan, Oct. 23, 1981, 56-169927
Int. Cl.³ G02B 9/62
U.S. Cl. 350—464 **3 Claims**



1. A wide angle copying lens system with high aperture efficiency including six individual lenses which are disposed in a pair of identical lens systems disposed in a perfectly symmetrical manner with respect to a stop located at the center, whereby the stop is disposed forwardly of each of the lens systems, each of the lens systems comprising: a first lens, formed by a positive meniscus lens, having its concave surface directed toward the stop; a second lens formed by a negative meniscus lens, disposed at a small air gap from the first lens and having its concave surface directed toward the stop; and a third lens, formed by a negative meniscus lens, having its concave surface directed toward the stop, the wide angle copying lens system satisfying the following requirements:

$5.32 < f/f_1 < 5.52$

$0.9 < f/f_{1,2} < 1.1$

$1.60 < n_1$

$1.02 < r_3/r_4 < 1.05$

$56 \pm n < \nu_1 < 56 \pm 3n$, when $\nu_2 = 41 \pm 0.5n$, where n represents an arbitrary real number,

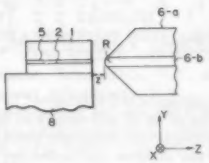
where n_1 represents the refractive index of the first lens and ν_1 to ν_3 the Abbe number of each of lens materials, f_1 the focal length of the first lens, $f_{1,2}$ the composite focal length of the first and the second lens, and f the composite focal length of the first to the third lens.

4,490,020

COUPLING SYSTEM FOR OUTPUT LIGHT OF SEMICONDUCTOR LASER

Haruo Sakaguchi, Tanashi; Norio Seki, Kamiuma, and Shu Yamamoto, Chofu, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1981, Ser. No. 267,554
Claims priority, application Japan, Jun. 11, 1980, 55/77877
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.18 **1 Claim**



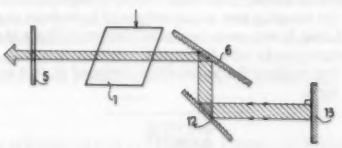
1. A coupling system for coupling the output light of an active layer of a semiconductor laser to a singlemode optical fiber characterized in that an end portion of the optical fiber to be coupled with the output light from the active layer of the semiconductor laser is formed into a quadrature pyramidal shape having a hemiellipsoidal tip so that, in two planes respectively parallel and perpendicular to the junction plane of the semiconductor laser, the width of said end portion continuously decreases towards said tip thereof to provide different radii of curvature at the tip such that the intensity distribution of transmitted light of the semiconductor laser and that of the optical fiber are effectively matched with each other in the two planes respectively parallel and perpendicular to the junction plane of the semiconductor laser independently of the optical fiber composition, whereby the efficiency of the coupling is optimized free of the composition of the optical fiber and the mode of the optical fiber.

4,490,021

OPTICAL FILTERING ELEMENT AND A SPECTRAL REFINING DEVICE INCLUDING THE SAME

Francois Moya, Orsay, France, assignor to Quantel S.A., Orsay, France

Filed Jul. 17, 1978, Ser. No. 925,528
Claims priority, application France, Jul. 21, 1977, 77 22405
Int. Cl.³ G02B 5/18; H01S 3/08
U.S. Cl. 350—162.23 **15 Claims**

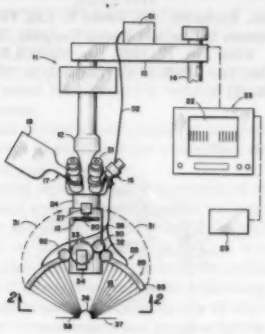


1. A device for achieving a spectral refinement of a radiated beam emitted by a laser comprising means defining a cavity containing a light amplifying medium and an output mirror of the laser, and a flitering element disposed in the cavity on the opposite side of the output mirror to the amplifying medium, the filtering element comprising a diffraction grating placed in the path of the beam and disposed with respect to the direction of the beam in such manner that the angle of incidence of the beam is at least equal to 80° and different from the angle of diffraction, and at least one additional optical element placed in the path of a component of the beam diffracted by said grating for returning to the grating a part of the light of said component.

4,490,022
APPARATUS FOR CORNEAL CORRECTIVE TECHNIQUES

Alvin E. Reynolds, 7732 E. 105 St., Tulsa, Okla. 74133

Filed Jan. 4, 1982, Ser. No. 336,920
Int. Cl.³ A61B 3/10
U.S. Cl. 351—211 14 Claims



1. Apparatus for use with a surgical microscope to perform corrective techniques on the eye, comprising:

means for projecting indicia onto the eye, a reflected image therefrom being indicative of corneal topography, said image being viewable through a surgical microscope, said means for projecting indicia is comprised of a pair of projecting members extending outward and downwardly from the sides of the surgical microscope and hingedly fixed to the surgical microscope and further including means for moving said projecting members between an operative, extended position and a stored position against the body of the microscope;

means or displaying on a viewing surface an image related to a predetermined surface shape; and

means or superimposing the indicia indicative of corneal topography onto the viewing surface with the image related to the predetermined shape to permit comparison of the indicia and image.

4,490,023
ARRANGEMENT FOR TEST MARK POSITIONING IN SPHERIC PERIMETERS

Manfred Ludwig, 8, Pfälzer Strasse, Jena, District of Gera, German Democratic Rep.

Filed Nov. 19, 1981, Ser. No. 320,056
Claims priority, application German Democratic Rep., Feb. 2, 1981, 227363
Int. Cl.³ A61B 3/02
U.S. Cl. 351—226 5 Claims

1. Arrangement for test mark positioning in spherical perimeters comprising

a semi-spherical screen having a concave and a convex face, said screen having a light-transmissive central rear projection portion,

a plurality of test markings being arranged on said concave face,

a light detecting means,

a substantially plane mounting means,

said light detecting means being provided on said mounting means in opposition to said convex face,

a double-projector for producing a first light beam and a second light beam substantially about an optical axis x—x, and directing said first and said second light beam to said central portion and to said light detecting means, respectively,

said double-projector being arranged between said central portion and said light detecting means,

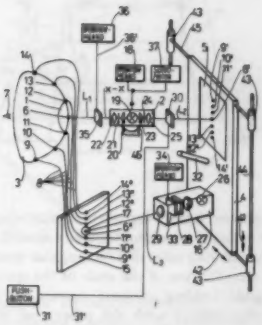
said double-projector, said central portion and said light detecting means being in optical alignment,

first means for moving said double-projector substantially at right angles to said optical axis x—x,

second means for displacing said plane mounting means in its plane,

a projector for producing a third light beam secured to said mounting means,

said third light beam being substantially at right angles relative to said plane of said mounting means,



an image plane being optically aligned relative to said projector,

said projector being for directing said third light beam to said image plane, and

a plurality of a light cables, the number of said light cables corresponding to the number of said test markings,

each of said light cables having a light entrance face in said image plane, and a light exit face in said test markings,

said light entrance faces having the same mutual spaced relation as said test markings on said screen.

4,490,024
MULTICOMPONENT ELECTROLYTE WITH A DEFINITE POTENTIAL AND A DISPLAY CELL CONTAINING IT

Jean Pompéi Katz de Warrens, Noisy-le-Roi, France, assignor to Jaeger, Levallois Perret, France

Filed Apr. 28, 1982, Ser. No. 372,675
Claims priority, application France, Apr. 30, 1981, 81 08686
Int. Cl.³ B02F 1/01, 1/29
U.S. Cl. 350—363 14 Claims

1. A multicomponent liquid electrolyte having a definite potential for electrolytic display cells, of the type based on at least one metal iodide dissolved in an anhydrous organic solvent, characterized in that it comprises the following three functional components:

(a) a first metallic element M_f, yielding at least two corresponding iodides of different valences for ensuring the equilibrium between the reduced forms of iodine I^- and I_3^-;

(b) an iodide of a second metallic element M_f, in a practically completely dissociated state, for fixing the concentration of the electrolyte in the anionic species I^-, and

(c) an iodide of a third metallic element M_x constituting the display vehicle.

4,490,025

SPECIMEN HOLDER FOR MICROSCOPES

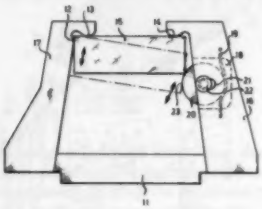
Klaus Weber, Konigsbronn; Siegfried Gerber, Oberkochen, and Horst Fischer, Aalen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Oberkochen, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 421,889

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138654

Int. Cl.³ G02B *21/24*

U.S. Cl. 350—529 5 Claims



1. In a specimen holder for use in a microscope, wherein an open frame includes two longitudinally spaced fixed stops for abutment by one long edge of a rectangular specimen slide and a fixed end stop for one of the ends of the specimen slide and a spring-loaded holding element carried by the frame and biased for engagement with the other end of the specimen slide, the improvement in which the holding element is a disc supported by said frame for rotation about its axis, said frame including guide means determining a limited extent of disc displacement in the direction of engagement with the other end of the specimen slide, and spring means reacting between said disc and frame and urging said disc in the general direction toward said fixed end stop.

4,490,026

MOUNTING FOR AN AIRBORNE TELESCOPE

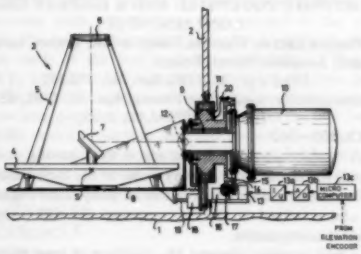
Hieronymus Weber, Konigsbronn-Zang, Fed. Rep. of Germany, assignor to Carl Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Jan. 18, 1983, Ser. No. 458,947

Claims priority, application Fed. Rep. of Germany, May 21, 1982, 8214826[U]

Int. Cl.³ G02B *23/06, 23/16*

U.S. Cl. 350—567 13 Claims



1. An airborne telescope and a suspension therefor adapted to suspend the telescope from and at one side of an aircraft bulkhead or fuselage partition, said suspension providing for telescope rotation or swing about two axes (**11**, **12**; **21**,**22**), characterized by the fact that at least one of the axes of rotation (**11**; **21**) intersects the telescope axis at offset from the center of gravity (S) of the telescope (**3**), and that a torque motor (**13**; **23**) is provided to compensate for telescope imbalance about said one axis of rotation.

4,490,027

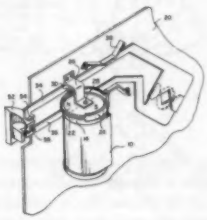
MAGNETICALLY ENCODED FILM CONTAINERS AND CAMERA ADJUSTING MECHANISMS RESPONSIVE THERETO

Lee F. Frank, Rochester, and James K. Lee, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,500

Int. Cl.³ G01R *33/02*; G03B *7/24, 17/26*

U.S. Cl. 354—21 9 Claims



1. A film container bearing magnetically encoded film information, characterized by, the information being encoded in the orientation of a macroscopic magnetic field having strength sufficient to physically move a mechanical magnetic sensor, whereby said encoded information is sensible either mechanically, or electronically.

4,490,028

EXPOSURE-CONTROL DEVICE ON AN AERIAL CAMERA

Gerhard Kucher, Lustenau, Austria, assignor to Wild Heerbrugg Aktiengesellschaft, Heerbrugg, Switzerland

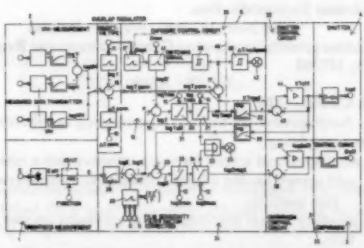
PCT No. PCT/CH82/00066, § 371 Date Jan. 5, 1983, § 102(e) Date Jan. 5, 1983, PCT Pub. No. WO82/04131, PCT Pub. Date Nov. 25, 1982

PCT Filed May 6, 1982, Ser. No. 457,075

Claims priority, application Switzerland, May 11, 1981, 3028/81

Int. Cl.³ G03B *39/00*

U.S. Cl. 354—66 19 Claims



1. An exposure control device for an aerial camera, comprising:

input means for receiving measured values of aircraft flying speed and height and of permissible image motion;

first means, coupled to said input means, for computing maximum permissible exposure time according to the relationship

$$T_{perm} = \frac{\Delta s_{perm}}{\frac{v}{h} \cdot f}$$

wherein

T_{perm} = said maximum permissible exposure time,

Δs_{perm} = said permissible image motion,

v = said flying speed, and

h = said flying height;

second means for determining an exposure interval;

an exposure meter for continuous integral metering of terrain brightness;

diaphragm and shutter control means for controlling the size of a diaphram aperture and for controlling shutter speed of a shutter; and

exposure control means, coupled to outputs of said first and second means and said exposure meter and coupled to said diaphragm and shutter control means, for adjusting shutter time T within a range (T_{min}, T_{perm}) representing a normal working range as a function of exposure conditions for a diaphragm value B after evaluating signals for T_{perm}, mean brightness, status signals of said diaphragm and shutter control means and process signals,

said exposure control means including a fault signalling device,

said exposure control means adjusting the diaphragm within the range (B, B_{max}), where B_{max} equals a minimum diameter diaphragm aperture according to brightness conditions encountered at limits of the normal working range reached at T_{min}, and adjusting the diaphragm within the range (B, B_{min}), where B_{min} equals a maximum diameter diaphragm aperture, upon reaching limits defined by T_{perm},

said exposure control means successively adjusting the aperture value B to discrete values $B' < B$, and for each of the discrete values B' adjusting the shutter time as a function of terrain brightness within the range (T_{min}, T_{perm}),

said exposure control means adjusting the shutter time within the range (T_{perm}, T_{max}) at B_{min}.

4,490,029

CAMERA WITH A FRAMING MIRROR

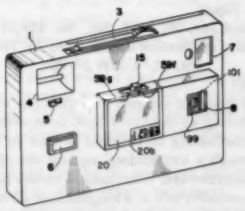
Harumi Tanaka, Kobe; Hiroshi Ueda, Nara; Keisuke Maeda, Sakai, and Akira Yoshizaki, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 20, 1983, Ser. No. 505,597

Claims priority, application Japan, Jun. 21, 1982, 57-107371

Int. Cl.³ G03B *9/64, 13/02, 17/24*

U.S. Cl. 354—106 **16 Claims**



12. In a camera:

a forwardly facing framing mirror;

a liquid crystal display member located in front of the mirror; and

control means for selectively transferring said liquid crystal display member between an overall transparent condition affording visual access to said mirror from a position in front of said mirror and an at least partially opaque condition at least partially masking said mirror.

4,490,030

APPARATUS FOR THE LIQUID-PROCESSING OF LIGHT-SENSITIVE SHEET MATERIAL

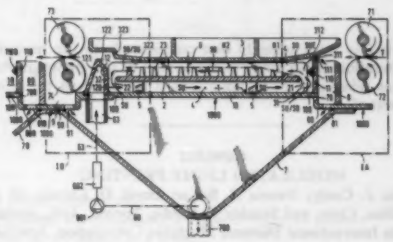
Leo Acklin, and Marcel Rossier, both of Marly, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Aug. 4, 1983, Ser. No. 520,378

Claims priority, application Switzerland, Oct. 5, 1982, 5847/82

Int. Cl.³ G03B *3/06*

U.S. Cl. 354—322 **31 Claims**



1. An apparatus for the liquid-processing of light-sensitive sheet material consisting essentially of at least one processing station comprising a substantially rectangular processing dish, circulating means for the feeding and withdrawal of processing liquid to and from the dish including a circulating pump, and means for conveying the sheets through said dish from a sheet entry end to a sheet exit end thereof, an intermediate bottom in said processing dish, a first and a second end wall of said processing dish, being arranged each transversely to the direction of sheet transportation through said dish, a first gap and a second gap between said first and said second end walls, respectively, and said intermediate bottom, a plurality of feeding nozzles disposed in a horizontal row in a first one of said end walls, said nozzles being adapted for feeding processing liquid into said dish, and the second end wall, opposite said first sidewall, being of a shape such that the processing liquid is caused to flow upwardly and through said second gap between said second end wall and a forward region of said intermediate bottom and such that there is imparted to said upward flowing processing liquid a liquid flow component which is directed toward said first end wall.

4,490,031

DEVICE FOR ADJUSTING MOVEMENT OF PHOTOGRAPHIC LENS AND FIELD OF VIEWFINDER

Makoto Mineshima, Tokyo, Japan, assignor to Kabushiki Kaisha Velonar, Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,578

Int. Cl.³ G03B *3/10, 17/00*

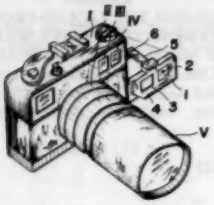
U.S. Cl. 354—402 **4 Claims**

1. An attachment device for an automatic focusing camera which has a window through which light passes to automatically control range of movement of the photograhic lens of said camera when making an exposure by detecting a distance between a subject and said camera plus a viewfinder for determining the visual field to be recorded by said exposure, said device which permits the taking of an exposure having a visual field different from that attainable with said photographic lens comprising;

a conversion lens of different focal length than said photographic lens adapted to mount on the front of said photographic lens, and

refraction means to compensate said automatic movement of said photographic lens for the mounting of said conver-

sion lens thereon comprising a prism adapted to mount on said camera to cover said window, said prism being structured to change the path of light passing through said



window by a angle D that corresponds to the required alteration in the range of movement of said photographic lens when said conversion lens is mounted on the front thereof.

4,490,032

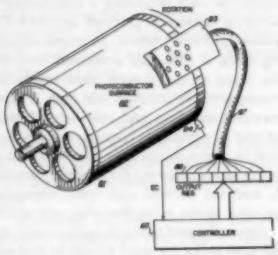
MODULATED LIGHT PRINTING

Douglas J. Conly; Bonnie B. Baker; David D. Larson, all of Boulder, Colo., and Stanley T. Riddle, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 146,714, May 5, 1980, abandoned. This application Jun. 14, 1982, Ser. No. 388,570

Int. Cl.³ G03G *15/04*

U.S. Cl. 355—14 R **3 Claims**



1. In copier/duplicator/printer apparatus for producing copies/duplicates/prints on a photosensitive medium, said copies/duplicates/prints normally comprising a centrally located user-originated image which is surrounded by an unused blank margin, said apparatus including document path means for transporting said copies/duplicates/prints through said apparatus, and a plurality of edge erase light emitting diodes disposed adjacent to and overlapping the document path means for erasing a selective width margin along the normally unused portion of each edge of said copies/duplicates/prints, the improvement comprising:

means for storing apparatus-originated data to be printed in the normally unused margin of said copies/duplicates/-prints; and

modulator means responsive to said stored data for turning said edge erase light emitting diodes on and off to cause said data to be printed in the normally unused margin of said copies/duplicates/prints;

said modulator means including:

register means for controlling said edge erase light emitting diodes, said register means having a plurality of stages, each stage controlling a separate one of said light emitting diodes; and

controller means responsive to said stored data for supplying a timed sequence of register settings to said register means to cause said stored data to be printed in the margin of said copies/duplicates/prints.

4,490,033

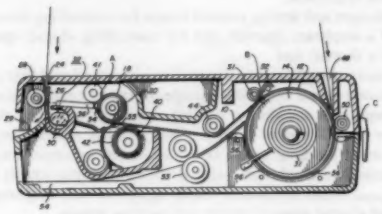
REPRODUCING APPARATUS WITH SCROLLED IMAGING WEB

Charles A. Gage, Webster; Timothy T. Blair, Shortsville, and Thomas W. Morgan, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1983, Ser. No. 489,620

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—16 **13 Claims**



1. An electrostatic reproducing apparatus comprising a reusable electrostatographic imaging web having an insulating imaging surface, a web supply roll and a web take up roll, one end of said web being fastened to said web supply roll, the other end of said web being fastened to said web take up roll, said web supply roll and said web take up roll being spaced apart, means to form an electrostatic latent image on said web, means to develop said electrostatic latent image on said web with toner to form a toner image, said means to form and said means to develop being sequentially positioned along said web between said web supply roll and said web take up roll, drive means to contact the leading edge of the toner image on said web with the lead edge of a copy sheet, means to wind said imaging web with said developed toner image thereon and said copy sheet around said take up roll, drive means to unwind said web from said take up roll and means to transfer said toner image from said web to a copy sheet, means to separate said copy sheet from said web, means to rewind said web on said supply roll in preparation for the next imaging cycle.

4,490,034

APPARATUS FOR CORRECTING AN UNEVENNESS IN AN INTENSITY OF ILLUMINATION OF AN ORIGINAL IN A COPYING MACHINE CAPABLE OF VARIABLE MAGNIFICATION

Hidekazu Imai, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1983, Ser. No. 459,553

Claims priority, application Japan, Feb. 23, 1982, 57-27701

Int. Cl.³ G03B *27/70*

U.S. Cl. 355—57 **2 Claims**

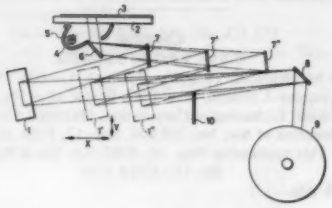
1. A copying machine capable of producing variable magnifications and having an in-mirror lens, comprising:

means for illuminating an original so that an image thereof passes through a longitudinal optical slit of said copying machine wherein said illumination means illuminates said original non-uniformly in a longitudinal direction which is parallel to said longitudinal direction of said optical slit so that marginal portions of said original are illuminated more than a center portion of said original;

means for reflecting said image which passes through said longitudinal optical slit to said in-mirror lens and then to a photo-sensitive material;

means for regulating an effective flux of light transmitted to said photo-sensitive material along a longitudinal direction thereof which is parallel to a longitudinal direction of

said optical slit, said regulating means being interposed fixedly at a predetermined position between said photo-sensitive material and said in-mirror lens, said regulating means decreasing an effective luminous flux transmitted to said photo-sensitive material along said longitudinal direction at a predetermined magnification above unity and less than a predetermined maximum of said copying machine wherein said regulating means comprises a member



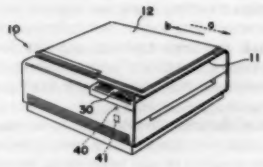
fixedly located so that a front surface of said member faces said in-mirror lens, said front surface having a cut-out portion at a center part thereof along an upper edge of said member so that peripheral longitudinal sections of said upper edge of said member interrupt a portion of said effective luminous flux passing between said in-mirror lens and said photo-sensitive material at said predetermined magnification.

4,490,035

ABNORMALITY DETECTING DEVICE FOR THE ORIGINAL CARRIAGE OF A COPYING MACHINE

Masamichi Sugiura, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 18, 1982, Ser. No. 409,136
Claims priority, application Japan, Aug. 20, 1981, 56-131202
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—8 **10 Claims**



1. An abnormality detecting device for a copying machine including a scanning means supported for reciprocal movement, for scanning an original to be copied, which device comprises:

a timer means capable of performing a time counting operation incident to the scanning movement of the scanning means and terminating the time counting operation upon completion of the scanning movement to produce count data;

means for storing the count data of the scanning movement and providing count data of the return movement;

means for determining whether or not a return movement of the scanning means is taking place, by subtracting the return count data from the data corresponding to the scanning time, during the return time period of the scanning means, to a predetermined value and to then determine whether the return movement has been normal or abnormal in reference to the predetermined value and the time at which the scanning means returns to the predetermined position.

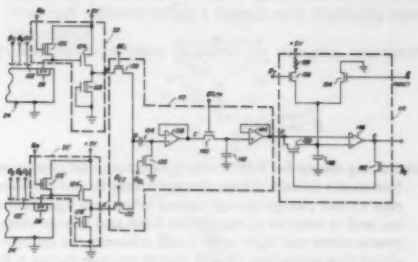
457 186 0 G; 84 8

4,490,036

IMAGE SENSOR AND RANGEFINDER DEVICE HAVING BACKGROUND SUBTRACTION WITH PAIRED ANALOG SHIFT REGISTERS

Constantine N. Anagnostopoulos, Mendon, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 18, 1982, Ser. No. 409,256
Int. Cl.³ G01C *3/10*; G03B *7/08*
U.S. Cl. 356—1 **5 Claims**



1. A range finder, comprising:

means energizable for projecting a beam of light to illuminate a spot on an object in a scene;

a linear array of photosensors responsive to light for generating a photosignal proportional to the quantity of light falling thereon;

means for forming an image of a portion of the scene containing the illuminated spot on said array;

first and second analog shift register means for receiving, in parallel, a plurality of analog signals, and responsive to control signals for delivering said analog signals serially to first and second output means respectively;

first and second means actuable for transferring the photosignals in said array to said first and second analog shift register means respectively;

control means for energizing said light beam and actuating said first transfer means, for deenergizing said light beam and actuating said second transfer means, and for supplying control signals simultaneously to said first and second analog shift register means to cause the photosignals therein to be delivered in synchronism to said first and second output means respectively;

differential means connected to said first and second output means and responsive to the photosignals thereat to form difference signals; and

signal processing means responsive to said difference signals for detecting the location of the image of said illuminated spot on said array and producing a distance signal in response thereto.

4,490,037

IMAGE SENSOR AND RANGEFINDER DEVICE HAVING BACKGROUND SUBTRACTION WITH BRIDGE NETWORK

Constantine N. Anagnostopoulos, Mendon, and Lee F. Frank, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 18, 1982, Ser. No. 409,257
Int. Cl.³ G01C *3/10*; G03B *7/08*
U.S. Cl. 356—1 **6 Claims**

1. In a rangefinding device of the type having means for projecting a beam of light to illuminate a small area on an object in a scene, and a plurality of photosensitive elements arranged to detect the location of the small area to determine the distance to the object, said rangefinding device including means for removing signal contributions due to ambient scene illumination from the photosignals produced by said photosensitive elements by sensing the scene with the light beam on,

sensing the scene with the light beam off, and differencing the respective signals produced thereby, the improvement comprising:

photosensitive means for producing a photocurrent in response to incident light;

charge storage means for accumulating photocurrent; and

switching means for selectively connecting said photosensitive means to said charge storage means to add photocurrent to said charge storage means when said light beam is on, and to remove photocurrent from said charge storage means when said light beam is off, whereby the difference signal thus remaining in said charge storage means is free from contributions due to ambient scene illumination.

4,490,038

MOBILE APPARATUS FOR DETERMINING THE LATERAL POSITION OF A RAILROAD TRACK

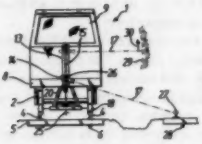
Jose Theurer, and Klaus Riessberger, both of Vienna, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jan. 4, 1982, Ser. No. 336,555

Claims priority, application Austria, Feb. 12, 1981, 664/81

Int. Cl.³ G01C *3/08*; E01B *35/02*

U.S. Cl. 356—5 **6 Claims**



1. A mobile apparatus for determining the lateral position of a railroad track with respect to an adjacent railroad track without physical contact with the adjacent railroad track and for indicating the determined lateral position, the adjacent railroad track having a rail including a rail head, which comprises

(a) a carriage mounted for movement along the railroad track,

(b) a laser beam emitting and receiving instrument mounted on the carriage for focussing on the adjacent railroad track to measure the distance thereof from the instrument, the instrument having coincident optical axes for emitting and receiving the laser beam, said axes being focussed at an angle on the rail head and said axes extending in a transverse plane perpendicular to the track,

(c) means for indicating the measured distance,

(d) a signaling device connected to the laser beam emitting and receiving instrument and responsive to a deviation of the measured distance from a desired distance of the adjacent track,

(e) a signal emitter indicating the angle,

(f) computer means connected to the instrument and to the signal emitter for determining at least the horizontal distance from the instrument to the rail head,

(g) a comparator unit connecting the signaling device to the computer means, the comparator unit being pre-adjusted to store admissible maximum and minimum distances to the adjacent railroad track,

(h) a drive for reversibly pivoting the optical axes of the instrument in the perpendicular plane, and

(i) a control unit connected to the computer means for reversing the drive to pivot the optical axes of the instrument in an opposite direction after the distance has been measured, the control unit being responsive to sudden changes in the measured distance.

4,490,039

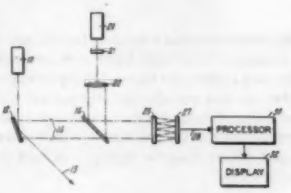
WAVE FRONT SENSOR

Joseph M. Bruckler, Titusville; James A. Gordon, III, Jupiter, and Stanley J. Scalise, West Palm Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 215,904, Dec. 12, 1980, abandoned. This application Mar. 25, 1983, Ser. No. 478,616

Int. Cl.³ G01J *1/20*

U.S. Cl. 356—121 **5 Claims**



1. An apparatus responsive to optical wave fronts comprising:

(a) switchable means for producing a reference beam of optical radiation for predetermined duration at a predetermined time and at a predetermined power level;

(b) means for combining said reference beam collinearly along a predetermined optical path with an input source beam of optical radiation;

(c) wave front dividing means disposed along said optical path having a plurality of apertures for dividing optical radiation traveling along said optical path into a plurality of corresponding source and reference sub-beams passing through the same aperture and for focusing said sub-beams into a plurality of corresponding source beam spots and reference beam spots, each having a predetermined spot area;

(d) optical detector means disposed to intercept said beam spots and responsive to said optical radiation, for detecting the position of said beam spots thereon, which detector means comprise at least one two-dimensional optical detector array having an array area substantially greater than said spot area, said detector array further comprising at least five contiguous photosensitive elements producing element output signals responsive to optical radiation and having an element area less than said spot area; and

(e) electronic means responsive to said element output signals for computing the distance between each of said reference beam spots and the corresponding source beam spot, which electronic means includes discriminator means having a first threshold set to reject element output signals generated by noise in said photosensitive elements, and in which apparatus said predetermined duration and said predetermined time are such that said reference beam impinges on said optical detector means with a duty cycle considerably less than a corresponding duty cycle of said input beam, whereby said input beam is detected with an advantageous signal-to-noise ratio;

in which apparatus said switchable means, said means for combining said reference beam collinearly, said wave front dividing means and said optical detector means have predetermined spatial relationships with each other and

with said optical path that are constant in time, whereby time-varying mechanical motion does not occur in said apparatus.

4,490,040

SPECTRALFLUOROMETER ARRANGEMENT

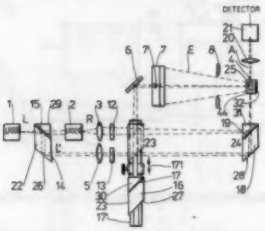
Hartmut Lucht, 12, Semnonenweg, 1185 Altglienicke, District of Berlin; Rainer Wendt, 11, Altheiderstrasse, 1199 Berlin, and Heinz Drommert, 4, Margaretenstrasse, 1150 Berlin, all of German Democratic Rep.

Filed May 18, 1982, Ser. No. 376,757

Claims priority, application German Democratic Rep., Jun. 10, 1981, 230692

Int. Cl.³ G01N *21/64*

U.S. Cl. 356—318 **11 Claims**



1. A spectral fluorometer arrangement comprising in mutual optical alignment, at least one laser light source for emitting at least one laser beam,

a cell for receiving a sample material to be analysed,

an emission monochromator, including a first holographic grating

and a detector,

said monochromator having an object point,

an entry slit and an exit slit,

said holographic grating having a central opening,

said monochromator having an optional axis passing the center of said central opening and the center of said sample material,

first means for directing said laser beam upon said sample material through said opening of said holographic grating,

said laser beam being for exciting said sample material,

said sample material emitting a luminescence radiation,

said luminescence radiation between said sample material and said grating being substantially in parallel to said axis,

said sample material being located in said object point of said emission monochromator,

second means for directing said luminescence radiation from said grating to said detector means,

said entry slit being located adjacent said object point,

said detector being for detecting said luminescence radiation.

4,490,041

DEVICE FOR APPLYING RADIATION AT ADJUSTABLE ANGLES

Fritz Riemer, Essingen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, d/b/a Carl Zeiss, Heidenheim, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,679

Int. Cl.³ G01J *3/18*

U.S. Cl. 356—334 **8 Claims**

4. A device for applying a beam of radiation to an object at variable adjustable angles of incidence of the beam impinging upon the object while maintaining the point of impingement of the beam on the object at a substantially constant point with respect to the object notwithstanding variations in the angle of incidence of the beam, said device comprising:

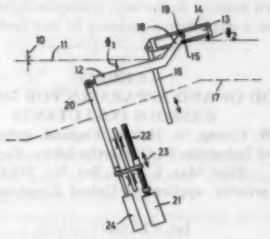
(a) an object to which radiation is to be applied;

(b) means for projecting a beam of radiation along a fixed path in a general direction toward said object but in non-intersecting relation to said object; and

(c) plane reflector intersecting said fixed path;

(d) said reflector being so positioned that radiation travelling along said fixed path in a general direction toward said object will be deflected by said reflector and will continue from said reflector along a second path impinging upon said object;

(e) said reflector being mounted for swinging movement



about a single swing axis which remains in fixed position in space while swinging said reflector during adjustment to a different angle of incidence and which is located relatively close to the point of impingement of said second path on said object;

(f) the mere swinging of said reflector on said single swing axis serving to vary the distance that radiation travels along said fixed path before striking and being deflected by said reflector and thereby serving to vary the angle of incidence of said second path upon said object;

(g) said swing axis being so located that the point of impingement of said second path upon said object is substantially constant notwithstanding swinging of said reflector on said single swing axis.

4,490,042

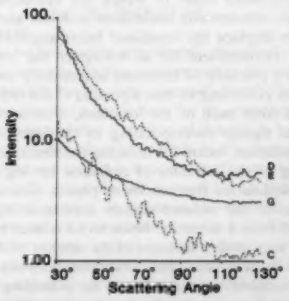
METHOD FOR DETERMINING THE PROPERTIES OF WINE

Philip J. Wyatt, 1939 Laguna St., Santa Barbara, Calif. 93101

Filed Jun. 4, 1981, Ser. No. 270,545

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—340 **18 Claims**



1. A method for deriving a quantitative measure of a bever-

age that will correlate to the subjective sensory stimuli response of beverage consumers or producers comprising the steps of:

(a) preparing an aliquot of the beverage sample;
(b) illuminating the aliquot or a dilution thereof with a beam of monochromatic light;
(c) detecting intensities of light scattered by the aliquot at a sufficient number of angles to obtain a characteristic scattering pattern arising from the particles present in the aliquot;
(d) recording or storing said pattern;
(e) quantitatively comparing said scattering pattern to a reference pattern or level;
(f) using the quantitative difference of said light scattering pattern relative to the said reference light scattering pattern as a quantitative measure of said beverage.

4,490,043

METHOD OF AND APPARATUS FOR MONITORING GASEOUS POLLUTANTS

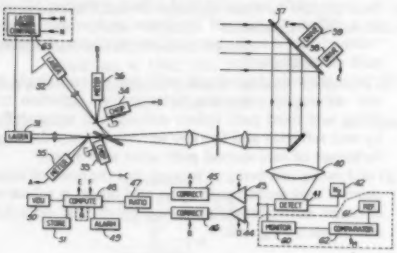
John H. W. Cramp, St. Helens, England, assignor to Imperial Chemical Industries PLC, Hertfordshire, England

Filed Mar. 1, 1982, Ser. No. 353,418

Claims priority, application United Kingdom, Mar. 2, 1981, 8106539

Int. Cl.³ G01N *21/35*

U.S. Cl. 356—407 **12 Claims**



7. Apparatus for the remote quantitative monitoring of one or more selected gases in a gaseous environment, which comprises laser sources for generating electromagnetic radiation capable of being tuned to give at least one detection beam containing a specific absorption wavelength of the gas or gases to be monitored and at least one reference beam having a wavelength that is significantly less strongly absorbed by the gas to be monitored, means for modulating the amplitude of each of the beams with different modulation frequencies or phrases, means for combining the modulated beams into a single combined beam in which the component modulated beams are substantially coincident with one another, scanning means to displace the combined beam angularly through the gaseous environment so as to direct the combined beam towards a plurality of locations sequentially and repetitively, means for collecting at least a portion of the radiation which is returned from each of the locations, a detector for deriving electrical signals corresponding to the intensity of the collected radiation, means for isolating the electrical signals corresponding to the intensity of radiation having the aforementioned modulation frequencies or phases, means for obtaining the ratio of the isolated signals corresponding to radiation collected from a detection beam and a related reference beam thereby to provide a measure of the amount of the selected gas or gases in each beam path traversed between the apparatus and the scanned locations, means for indicating the amount of gas detected, and means for varying according to a predetermined programme or in response to an external stimulus, the amount of radiation from the laser sources which is detected by the detector thereby to prevent the detected amount from exceeding a predetermined level.

4,490,044

AUTOMATIC SLURRY CONCENTRATION CONTROL SYSTEM

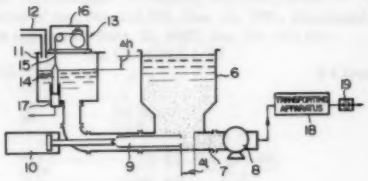
Makoto Saito, Ibaraki; Masakatsu Sakamoto, Matsudo; Kenji Uchida, Kashiwa, and Yukishige Kamino, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 18, 1983, Ser. No. 458,924

Claims priority, application Japan, Mar. 5, 1982, 57-33829

Int. Cl.³ B28C *7/04*

U.S. Cl. 366—17 **7 Claims**



1. In an automatic slurry concentration control system comprising:

a mixing tank filled with a charge of slurry of solids-containing water;

a clear water tank for supplying clear water;

a suction tube of a slurry supply pump located in an opening in a lower portion of the mixing tank; and

a movable tube for adjusting the opening of the mixing tank, wherein the concentration of slurry in the suction tube can be controlled by adjusting the movable tube; the improvement comprising:

a clear water control device provided for the clear water tank to the suction tube for controlling the amount of clear water supplied from the clear water tank in accordance with the amount of slurry delivered from the mixing tank.

4,490,045

CONCRETE MIXER

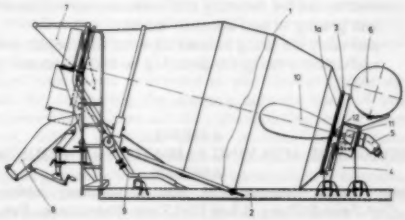
Gerhard Hudelmaier, Ulm, Fed. Rep. of Germany, assignor to Ingrid Hudelmaier, Ulm, Fed. Rep. of Germany

Filed Jan. 19, 1982, Ser. No. 340,711

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1981, 3101468

Int. Cl.³ B28C *5/24*

U.S. Cl. 366—56 **7 Claims**



1. A concrete mixer comprising:

a drum rotatable about an inclined axis, the drum having at one end a closed bottom disposed about the axis and at the other end an open top disposed about the axis;

a vibrator located in the drum at the bottom thereof;

a drive unit for the vibrator located outside the drum in the vicinity of the bottom thereof; and

means for coupling the drive unit to the vibrator through the bottom of the drum, thereby introducing vibrational energy into material to be mixed at the bottom of the drum.

4,490,046

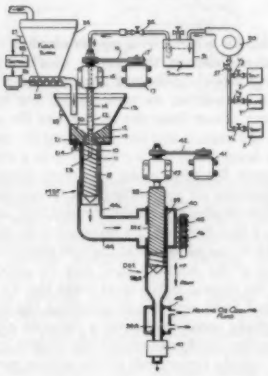
MULTI-STAGE AUTOMATIC DOUGH-PRODUCING SYSTEM

Raul Guibert, 10374 Summer Holly Cir., Los Angeles, Calif. 90024

Continuation-in-part of Ser. No. 272,344, Jun. 10, 1981, Pat. No. 4,352,567. This application Jan. 13, 1982, Ser. No. 339,186

Int. Cl.³ B29B *1/06*; B01F *5/12*

U.S. Cl. 366—76 **13 Claims**



1. A multi-stage system for automatically and continuously producing dough from a source of flour and a source of dough-forming solution that includes yeast, said system comprising:

A. a mixing stage coupled to said sources and including a first screw provided with a nozzle and operating within a cylindrical chamber having an outlet at an adjustable rate to intermix said flour and said solution to form a paste which is discharged from its outlet, said first screw having an axial bore therein into which said solution is fed, said bore communicating with said nozzle in the first screw whereby the solution is projected therefrom against a film of flour formed on the inner surface of the chamber by the first screw;

B. a development stage including a second screw independent of a first screw, said second screw having an input end and an output end, said second screw being driven at said input end at an adjustable rate by a variable speed motor, said second screw rotating within a tube having an inlet gap therein surrounded by a housing which communicates with the outlet of the mixing stage, whereby the paste therefrom is supplied to the development stage laterally through the inlet gap, and means to displace the longitudinal position of the gap relative to the second screw, so that it moves toward or away from said input end, whereby the portion of the second screw between the inlet gap and the output end of the second screw represents the operative portion thereof which acts to knead and develop the incoming paste to retain the gases generated by the yeast to produce dough, the length of the operative portion being adjustable to effect the desired degree of development appropriate to the paste derived from said sources.

4,490,047

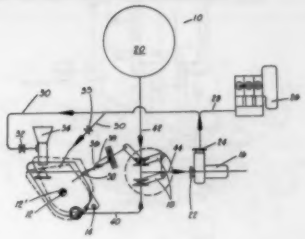
CONSTANT LEVEL ADDITIVE MIXING SYSTEM

Calvin L. Stegemoeller, and Lonnie R. Walker, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 11, 1983, Ser. No. 474,615

Int. Cl.³ B01F *15/02*

U.S. Cl. 366—132 **17 Claims**



1. A mixing system for the mixing of materials by well servicing equipment used in well servicing operations and the like, said mixing system comprising:

tank means for use in the mixing of materials, the tank means having a fluid inlet and fluid outlet;

movable mixing tub means for use in the mixing of materials, the movable mixing tub means having a fluid inlet, fluid outlet and the center of gravity thereof offset from the axis about which the movable mixing tub means is movable;

pump means for use in the mixing of materials, the pump means having the inlet thereof connected to the fluid outlet of the tank means and the fluid outlet of the movable mixing tub means; and

leveling valve means for use in the mixing of materials, the leveling valve means being disposed between the fluid outlet of the tank means and the inlet of the pump means, the leveling valve means interconnected to the movable mixing tub means such that movement of the movable mixing tub means is imparted to the leveling valve means to control the flow of fluid from the tank means to the inlet of the pump means.

4,490,048

APPARATUS FOR PRODUCING A PREFERABLY CHEMICALLY REACTIVE MIXTURE FROM TWO OR MORE PLASTICS COMPONENTS

Klaus Schlueter, Munich, Fed. Rep. of Germany, assignor to Elastogran Maschinenbau GmbH, Strasslach, Fed. Rep. of Germany

Filed Jan. 11, 1983, Ser. No. 457,185

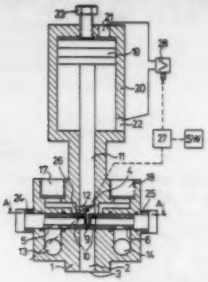
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 3201903

Int. Cl.³ B01F *15/02*

U.S. Cl. 366—134 **8 Claims**

1. Apparatus for producing a preferably chemically reactive mixture of two or more plastics components, which apparatus comprises a housing having inlet channels for the individual plastics components and a guide bore for an expulsion plunger which can move to and fro, a portion of this guide bore being constructed as a mixing chamber which, in the retracted position of the expulsion plunger, is bounded by the end face of the plunger, while at the opposite side is provided an outlet orifice for the mixture of plastics components, a restrictor movably located in a bore running transversely to the guide bore of the expulsion plunger, being located immediately downstream of the mixing chamber, the restrictor being formed of two at least approximately coaxially arranged nozzle bodies which can slidingly enter the guide bore, each of said nozzle bodies having inlet orifices for the plastics components, said inlet orifices being so arranged relative to the mixing chamber that the

plastics components impinge on one another at an angle in the mixing chamber and whereby movement of said nozzle bodies



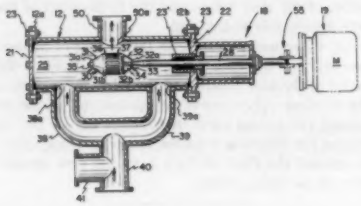
will define an adjustable gap between them and open and close said inlet orifices.

4,490,049

MIXING ARRANGEMENT

John T. Sanders, and Donald L. Stewart, both of Houston, Tex., assignors to Cron Chemical Corporation, Houston, Tex.

Filed Jun. 2, 1983, Ser. No. 500,580
Int. Cl.³ B01F *5/12, 15/02*
U.S. Cl. 366—134 **10 Claims**



1. A mixing arrangement including:

a. longitudinally extending housing means with end closures to form a closed mixing chamber within said housing means;

b. mixing means rotatably supported on shaft means which extends through one of the end closures, said rotatable mixing means including:

1. a pair of spaced frusto-conical members, each of which has a concentric hub with vanes connected between the hub and its respective member whereby each member may be supported on the shaft means;

2. each of said members having full open end portions with the small end defining an end fluid inlet and the larger end an outlet end for the fluid entering the inlet end;

3. a cylindrical member secured to and extending between the larger discharge ends with openings spaced about the periphery thereof to define discharge ports from the mixing means;

c. housing inlet means for communicating fluid materials to said closed mixing chamber in said housing means, said inlet means comprising a pair of conduits to discharge fluid materials into the mixing chamber adjacent the end fluid inlet of each of said pair of frusto-conical members; and

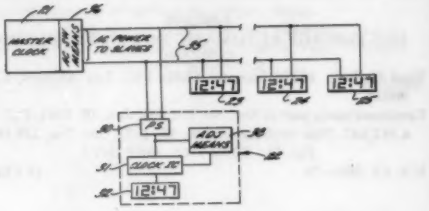
d. housing outlet means to receive the discharge from said mixing means and said closed mixing chamber.

4,490,050

MASTER/SLAVE CLOCK SYSTEM

Dilip T. Singhi, Skokie, Ill., assignor to Rauland-Borg Corporation, Chicago, Ill.

Filed Apr. 29, 1983, Ser. No. 489,859
Int. Cl.³ G04C *11/00, 13/08*
U.S. Cl. 368—46 **10 Claims**



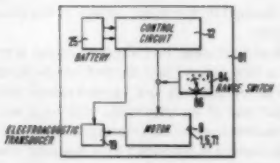
1. A slave clock for control by a master clock in a master/-slave clock system wherein the master clock supplies a-c power to all slave clocks connected thereto, said slave clock comprising, in combination, an unregulated d-c supply for receiving a-c input power from the master and for producing d-c power from the master and for producing d-c power at a nominal voltage level when the a-c supply is at a nominal a-c level, setting means for responding to a first signal level to remain deactivated and for responding to a second signal level to increment a time display at a predetermined rate, adjustment means including a threshold switch responsive to the d-c supply for producing an output signal at the first signal level when the d-c supply is at the nominal level and for producing an output signal at the second signal level when the d-c supply is below the nominal level, and means coupling the adjustment means to the setting means whereby a reduced a-c voltage level from the master clock will reduce the output level of the unregulated d-c supply for control of the setting means.

4,490,051

ELECTROMECHANICAL SHORT INTERVAL TIMER

Hans Flaig, Schramberg; Egon Rapp, Schonbronn; Herrmann Brede, Schiltach, and Wolfgang Ganter, Schramberg, all of Fed. Rep. of Germany, assignors to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Nov. 10, 1983, Ser. No. 550,626
Int. Cl.³ G04F *8/00*
U.S. Cl. 368—109 **22 Claims**



1. An electromechanical short interval timer comprising:

a housing,

an actuating element mounted on said housing for manual movement from a rest position,

control means for returning said element to said rest position, and comprising:

an electric motor, operably connected to said actuating element,

an electric power source,

an electric timekeeping circuit connected

to said power source for supplying electronic actuating pulses to said motor, and

manually adjustable means for varying the pulse frequency supplied to said motor, and

a signal emitter activated in response to said actuating element reaching a predetermined position of its return movement.

4,490,052

WATCHCASE

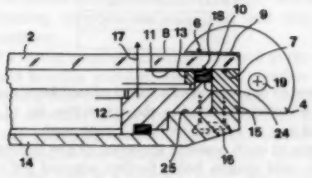
Paul Gogniat, Bienne, Switzerland, assignor to Montres Rado S.A., Longeau, Switzerland

Filed May 18, 1982, Ser. No. 379,360

Claims priority, application Switzerland, Jun. 1, 1981, 3557/81

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—292 **9 Claims**



1. A watchcase assembly for attaching a thin flat crystal to the watchcase, said crystal being substantially coextensive with said watchcase, said assembly comprising a plurality of separate fixation members attaching the watchcase to the crystal, said fixation members each having inwardly directed grooves sized to receive the edges of the crystal, said grooves comprising parallel facing surfaces spaced apart a distance slightly greater than the thickness of said thin flat crystal to engage said crystal, a sealing strip applied against the perimeter of the lower face of the crystal in the region of said fixation member, the upper of said parallel facing surfaces bearing against the upper face of the crystal, the area of contact at the fixation member between the sealing strip and the lower face of the crystal and between the upper surface of said facing surface and the upper face of the crystal being vertically aligned with each other, the dimensions of the fixation member being substantially smaller than the corresponding dimensions of the crystal, further comprising a retaining ring comprising at the top thereof a bearing surface for the sealing strip and means for thrusting the retaining ring towards the crystal thus pressing said sealing strip against the inner face of the crystal.

4,490,053

TEMPERATURE THRESHOLD DETECTOR

Charles J. Coston, Sunnyvale, and Euel V. Higgins, San Jose, both of Calif., assignors to Lockheed Missiles & Space Company. Inc., Sunnyvale, Calif.

Filed Apr. 15, 1983, Ser. No. 485,241

Int. Cl.³ G01N *25/72*; F16L *55/04*

U.S. Cl. 374—5 **20 Claims**

20. An apparatus for detecting a leak in a vessel seal, said apparatus comprising:

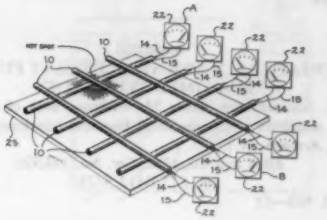
(a) an elongate sensor responsive to a temperature rise above a predetermined value, said temperature rise being attributable to the leak in said seal, said sensor being positionable circumjacent said seal, said sensor comprising:

(i) a first electrical conductor,

(ii) a second electrical conductor, and

(iii) a spacing structure separating said first and second electrical conductors,

said first and second electrical conductors being made of dissimilar metals, said spacing structure being made of an ionic salt selected from the group consisting of KNO_3 and $NaNO_3$, said ionic salt having an electrical resistivity that is temperature dependent so that said spacing structure provides substantial electrical isolation between said first and second electrical conductors when exposed to a temperature below said predetermined value, and so that said spacing structure acts with the dissimilar metals of said first and second electrical conductors when exposed to a temperature above said predetermined value to cause a self-generated electromotive force to develop across said first and second electrical conductors, and



(b) an instrument for indicating temperature rise above said predetermined value, said instrument having a first electrical lead connected to said first electrical conductor and a second electrical lead connected to said second electrical conductor, said electromotive force driving said instrument to indicate said leak.

4,490,054

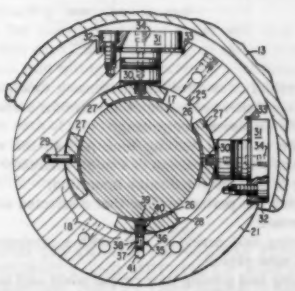
MACHINE TOOL BEARING SYSTEM

Rudolf J. A. Kimmelaar, Vlaardingen, Netherlands, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Mar. 21, 1983, Ser. No. 477,360

Int. Cl.³ F16C *32/06*

U.S. Cl. 384—117 **3 Claims**



1. A machine tool bearing system, comprising:

(a) a housing, having at least one horizontal spindle bore;

(b) at least one bearing set located in said bore, and having at least two rocking shoe segments, each having an arcuate spindle bearing surface, one segment disposed at the top of said bore and the other segment disposed at the bottom of said bore;

(c) a spindle, rotatably journalled in said spindle bearing set;

(d) means for supplying fluid at a first, relatively low operating pressure to said spindle bearing surfaces, substantially filling said bearing set with said fluid and immersing said bearing surfaces;

(e) a hydrostatic pressure area defined on the spindle bearing surface of the bottom rocking shoe segment;

(f) means for supplying fluid at a second, relatively high operating pressure from a pressure source along a supply

line passing through said housing and bottom shoe segment into said hydrostatic pressure area;

(g) means for hydrodynamically generating a third operating pressure on said bearing surfaces by spindle rotation, said third operating pressure being higher than said second operating pressure; and

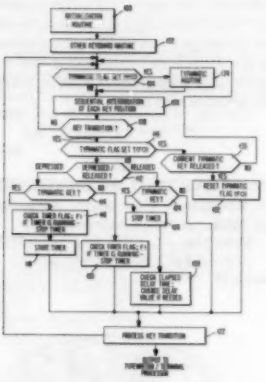
(h) means for discontinuing second pressure fluid flow into the hydrostatic pressure area in response to said third pressure when the third pressure exceeds the second pressure.

4,490,055

AUTOMATICALLY ADJUSTABLE DELAY FUNCTION FOR TIMED TYPAMATIC

Carl F. Johnson, and James M. Williams, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,928
Int. Cl.³ B41J *5/28*
U.S. Cl. 400—51 **11 Claims**



1. A method of controlling the sensing time period for detecting a condition indicative of a desire for a character to be repetitively displayed comprising:

providing a preset sensing time period, the exceeding of which by the depression of a single character key is indicative of a repetitive display operation;

measuring the period of time that a selected control key is depressed;

comparing said period of time with a predetermined standard time period;

increasing said sensing time period when said period of time exceeds said standard time period, whereby an operator who is slow and holds keys depressed for a longer period of time than normal will not undesirably display multiple characters.

4,490,056

COMBINATIONAL KEYBOARD UTILIZING SEQUENTIAL OPERATION OF KEYS

Ranald O. Whitaker, 4719 Squire Dr., Indianapolis, Ind. 46241

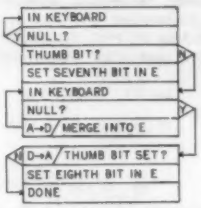
Filed Sep. 22, 1982, Ser. No. 421,462
Int. Cl.³ B41J *5/06*
U.S. Cl. 400—100 **5 Claims**

1. A system for generating coded characters, said system having a keyboard, a controller, and a processor;

said keyboard having a set of keys adapted for being depressed in combinations, a combination being that subset of said keys each of which keys is depressed at some time during a combination period, a combination period being that period of time between two successive time intervals when no key is depressed;

each of said coded characters comprising a first set of bits and a second set of bits, all of said bits being normally in their "OFF" state;

each key of said set of keys having a respective bit in said first set of bits;



in response to depression of a subset of said keys, said system being adapted for causing the respective bit of each depressed key to assume its "ON" state; and

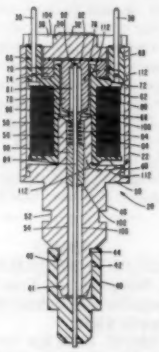
in response to each possible sequence of key depression and release, said system being further adapted for causing a respective subset of said second set of bits to assume its "ON" state.

4,490,057

PRINT WIRE SOLENOID

John W. Reece, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed May 3, 1983, Ser. No. 491,116
Int. Cl.³ B41J *3/12*
U.S. Cl. 400—124 **11 Claims**



1. A solenoid for moving a print wire to a printing position comprising:

a housing member having first and second ends;

a first magnetic flux conducting member enclosing said first end of said housing member and having an aperture extending therethrough;

a sleeve member mounted on a portion of said first conducting member having a cylindrical-shaped extension portion and and an axially oriented aperture extending therethrough;

a second magnetic flux conducting member mounted on said extension portion of said sleeve member;

a plunger member slidably positioned in said axially oriented aperture for movement between a home and an actuated position;

a print wire secured to said plunger member;

a coil member positioned on said sleeve member for providing, upon energizing of said coil member, a magnetic flux in a path through said housing member, said first and second conducting members and said plunger member to cause axial movement of said plunger member from said home to said actuated position for driving the print wire to a printing position;

means engaging said plunger member for maintaining said plunger member in said home position prior to energizing of said coil member and for returning said plunger member to said home position upon the deenergizing of said coil member;

an energy absorbing member positioned adjacent said second conducting member and adjacent said plunger member for absorbing the return movement of said plunger member to the home position;

an enclosure member mounted in said second end of said housing member and engaging said energy absorbing member;

and a spring member releasably secured to the second end of said housing member, said spring member engaging and biasing said enclosure member against said energy absorbing member, said spring member in turn biasing said energy absorbing member against said second flux conducting member and said plunger member, said spring member serving both as a means to retain said enclosure member, said energy absorbing member, said second flux conducting member and said sleeve member in said housing member and as a means to bias said energy absorbing member against said plunger member to absorb the energy of the plunger member as it returns to the home position from the actuated position.

4,490,058

LINE PRINTER AND TYPE CARRIER FOR USE THEREIN

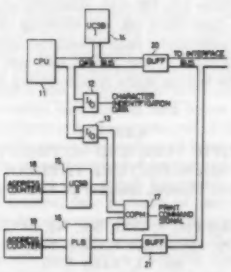
Hisayoshi Monma; Masao Miyasaka, and Kazuyuki Kubo, all of Ibaragi, Japan, assignors to Hitachi Koki Co., Ltd., Japan

Division of Ser. No. 309,134, Oct. 6, 1981, Pat. No. 4,413,558. This application Aug. 2, 1983, Ser. No. 519,450

Claims priority, application Japan, Oct. 7, 1980, 55-140833; Feb. 20, 1981, 56-24566

Int. Cl.³ B41J *1/20*

U.S. Cl. 400—146 **7 Claims**



1. A line printer type carrier having N character positions for use in a line printer coupled to a computer system using an M-character type data array consisting of $Q=M\div P$ identical sets of P printable characters each, said line printer type carrier having N character positions made up of K indentical sets of characters each set including P printable characters and R dummy characters, the number of said dummy characters being dependent upon the number of printable characters in each set, where N, K, P, R and Q are integers with $K>Q$ and $N=K\ (P+R)$.

4,490,059

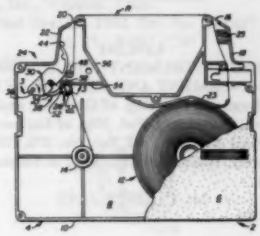
RIBBON METERING DEVICE

James R. Daughters, Danville, Calif., assignor to Wordex, San Leandro, Calif.

Filed May 4, 1983, Ser. No. 491,507

Int. Cl.³ B41J *35/28*

U.S. Cl. 400—208 **15 Claims**



1. An improved ribbon metering drive for use with a ribbon cartridge of the type including a case having a top, a bottom and a side member defining a ribbon entrance and a ribbon exit, a supply of ribbon housed within the case and passing from the ribbon supply out the ribbon exit and into the ribbon entrance for gathering at a ribbon take up region within the case, the improvement comprising:

a drive roller having a drive axis and being mounted within the case for rotation about said drive axis;

an idler roller having an idler axis;

said drive and idler rollers having roughened drive surfaces;

means for rotatably mounting said idler roller within the case with said roughened drive surfaces adjacent one another to define a nip thereat to pinch ribbon passing therebetween at the nip;

means for defining a ribbon path through said ribbon drive including a first portion passing about substantially more than half said roughened drive surface of said idler roller as measured from the nip; and

means for biasing said idler roller and said drive roller towards each other consisting of spring means and said ribbon, said spring means exerting a constant bias on said idler roller in a first direction, said ribbon providing a variable force in addition to said constant force as a result of the path of said ribbon, a tension in said ribbon resulting from the driving of said ribbon acting to urge said idler roller against said drive roller and thereby provide said variable force.

4,490,060

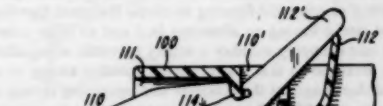
PRINTING APPARATUS USING SNAP FINGER FEED ASSEMBLY AND METHOD OF ASSEMBLY

John D. Mistyurik, Tipp City, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 349,497, Feb. 17, 1982, Pat. No. 4,433,624. This application Oct. 3, 1983, Ser. No. 538,446

Int. Cl.³ B41J *11/26*; B65H *3/36*

U.S. Cl. 400—617 **11 Claims**



1. A feed finger assembly for feeding a web, comprising: a holder including a first projection having a first shoulder, a

feed finger engageable with a web and including an undercut open-sided recess having a second projection defining a second shoulder, the first and second shoulders being in contact and holding the feed finger hooked to the holder, and wherein the first shoulder supports the feed finger at its second shoulder for pivotal movement.

4,490,061

WRITING INSTRUMENT FOR AUTOMATIC ADVANCEMENT AND FEED OF LEADS

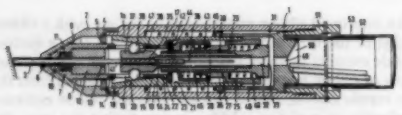
Otto Katz, Schwabach, Fed. Rep. of Germany, assignor to A.W. Faber-Castell, Nuremberg, Fed. Rep. of Germany

Filed Apr. 20, 1982, Ser. No. 370,126

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125441

Int. Cl.³ B43K *21/02*

U.S. Cl. 401—53 **18 Claims**



1. A writing instrument with automatic advancement and feed of successive leads, comprising a housing having a tip part; a lead protecting pipe having an axis and movable in an axial direction; a lead container spaced from said protecting pipe in the axial direction; a gripping sleeve extending between said lead container and said lead protecting pipe; a lead clamping member having a plurality of clamping arms and movable between open and closed positions in axial direction, said clamping arms of said lead clamping member being arranged to abut against said gripping sleeve under a spring action and having a clamping opening with a receiving portion, said lead clamping member having a shaft connected with said clamping arms; a titling member surrounding said shaft of said clamping memeber and coupled with the latter, and following a wear of a lead located in said lead protecting pipe, said tilting member uncouples from said shaft at a plurality of locations of the latter and said shaft of said clamping member displaces in a stepless manner in correspondence with a path of movement of said lead protecting pipe and displaces said clamping member in the axial direction toward said tip part so as to open said clamping member so that a further lead moves freely from said lead container through said clamping member to abut against a rear end of the lead located in said lead protecting pipe, and during movement of said lead protecting pipe in an opposite direction out of said tip part of said housing said tilting member becomes again coupled with said shaft of said clamping member; a pressure sleeve connected with said lead protecting pipe, and having an annular collar, said tilting member having a control edge formed outside of a lead center and being pivotable about said control edge during the movement of said lead protecting pipe with said pressure sleeve; a recoil spring cooperating with said tilting member and forming an elastic abutment therefor; a conical sleeve having an abutment face and an inner cone in which said clamping member is axially movable; an equalizing spring arranged so that said clamping member moves in said conical sleeve against the action of said equalizing spring; and an axially movable bell member arranged under the action of said recoil spring and having a further control edge, said tilting member being formed as a clamping disc having a front side facing toward said tip part of said housing and abutting against said abutment face of said conical sleeve and said annular collar of said pressure sleeve, and a rear side abutting against said further control edge of said bell member.

4,490,062

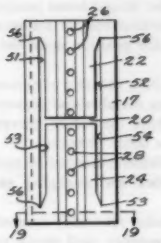
COUPLINGS FOR SIGN POSTS AND THE LIKE

Douglas B. Chisholm, 2865 Sutton Oaks La., Vienna, Va. 22180

Continuation-in-part of Ser. No. 898,892, Apr. 21, 1978, Pat. No. 4,236,843. This application Dec. 1, 1980, Ser. No. 211,936

Int. Cl.³ F16B *7/00*

U.S. Cl. 403—2 **13 Claims**



1. An upright assembly comprising;

(a) a generally vertical upright member; (b) a generally vertical base member; (c) at least one web comprising (i) means defining at least one linear generally vertical groove therein, (ii) means defining a through-extending opening adjacent at least one end of said groove and generally transverse thereto, said opening defining a first portion of said web on one side thereof, and a second portion of said web on the other side thereof, so that the portion of the web on either side of said opening will separate under impact loading; (d) means for attaching said first web portion to one of said members; and (e) means for attaching said second web portion to the other of said members, wherein the improvement comprises:

said means defining at least one linear generally vertical groove in said web comprises means defining a plurality of through-extending slits including a first through-extending slit extending from said through-extending opening in a first direction, a second through-extending slit extending from said through-extending opening generally parallel to said first slit and defining said first web portion therebetween, a third through-extending slit extending from said through-extending opening in a second direction, opposite said first direction, and a fourth through-extending slit extending from said through-extending opening generally parallel to said third slit and defining said second web portion therebetween; each of said through-extending slits terminating short of the end of said web and having an out-of-plane tearing stress concentrating termination.

4,490,063

TELESCOPIC TUBE AND METHOD FOR THE MANUFACTURE THEREOF

Yrjö Aho, Espoo, Finland, assignor to Exel Oy, Helsinki, Finland

Filed Feb. 9, 1982, Ser. No. 347,324

Claims priority, application Finland, Feb. 13, 1981, 810457

Int. Cl.³ F16B *7/10*

U.S. Cl. 403—109 **5 Claims**

1. A plastic reinforced telescopic tube comprising:

a plurality of relatively slideable tube members, which are fitted within each other, which are straight cylindrical

tubes along a major part of their lengths, and which are formed by coating a core having a straight end and a tapered end with layers of resin-moistened fibers including a layer of lengthwise fibers upon which is wound a layer of cross-fibers;

an external conical bulge, which diverges towards the first end of each tube and which is formed by winding an additional layer of cross-fibers at the straight end of the core; and

an internal conical bulge, having a substantially external cylindrical surface, which converges toward the second end of each tube and which is formed by winding an additional layer of cross-fibers at the tapered end of the core;

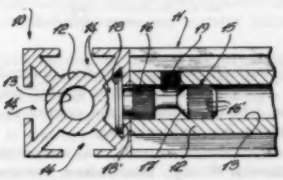
whereby the conical faces of the bulges are long enough and so gently inclined that they insure friction engagement capable of supporting axial loads.

4,490,064

JOINT FOR MODULAR FRAME CONSTRUCTION

Jacques Ducharme, 5410, 2nd Ave., Rosemont, Montreal, Canada H1Y 2Y3

Filed Jun. 18, 1982, Ser. No. 389,984
Int. Cl.³ F16B *12/32*
U.S. Cl. 403—255 **1 Claim**



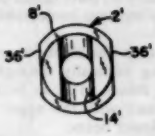
1. A releasable joint for modular frame construction comprising a first and a second elongated frame member and a connector member for releasably securing said two frame members together, each frame member having a T-shaped slot extending longitudinally of the same and defined by a channel opening at an external face of said frame member and by an inner chamber wider than said channel and defining internal face portions of each side of said channel, said first frame member having a transverse and flat end face, and further including a central tubular portion defining a cylindrical bore extending longitudinally of said first frame member and opening at said end face, said connector member made of a harder material than that of said frame members, and having a cylindrical portion which has longitudinal serrations and which slidably engages within said bore of said frame member, said connector member further having at one end of said cylindrical portion an outwardly-projecting enlarged head engaging into the T-shaped slot of said second frame member, said head having an inner contact face which has radial serrations and which faces said internal face portions of said second frame member, said cylindrical portion having a groove circumferentially formed around the same intermediate the ends thereof and defining opposite said head a camming surface which is radially inwardly inclined towards said head, and a screw threaded transversely in said tubular portion of said first frame member, having an outer end accessible through said T-shaped slot and having an inner end engaging said camming surface; tightening of said screw both axially and laterally displacing said cylindrical portion within said bore to cause the radial serrations of said head to dig into said internal face portion and press said second frame member laterally against the flat end face of said first member and to cause those longitudinal serrations of said cylindrical portion which are opposite to said screw to dig into said tubular portion, whereby relative rotation of said two frame members about the axis of the bore of said first frame member is prevented and said radial serrations also prevent movement of said head along the T-shaped slot of said second frame member.

4,490,065

SPLICE LOCKING DEVICE

Ray D. Ullrich, Houston; Douglas C. Sherman, Conroe, and Leo Licon, Jr., Houston, all of Tex., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 16, 1982, Ser. No. 450,417
Int. Cl.³ B25G *3/00*
U.S. Cl. 403—379 **4 Claims**



1. A device for locking a joint between two telescoping members, each member having a hole aligned with the corresponding hole in the other member, comprising:

a bolt, having a shank portion and a projecting lug portion adjacent one end, the lug and shank forming a T-shape extending radially outward from the shank portion and having a span greater than the diameter of said holes, for contacting the inner telescoping member;

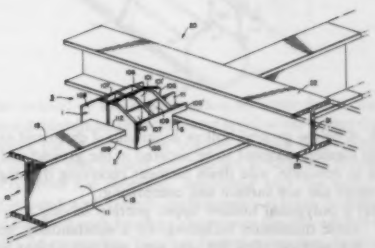
a bushing, having a neck for fitting within said aligned holes and an enlarged head disposed adjacent to one end for contacting the outer telescoping member, the bushing further including a central bore running the entire length of the bushing for slidingly receiving the shank portion of the bolt therewithin, and a channel, disposed in the neck portion of the bushing, and extending diametrically across the bushing neck for allowing longitudinal movement of the lug within the bushing neck, and means cooperating with the bushing for drawing the lug toward the head of the bushing, thereby locking said device in said holes.

4,490,066

CLAMPING SYSTEM FOR HEAVY "I" BEAMS AND THE LIKE ON OIL RIGS, ETC.

Jim C. Hanlon, 4545 McArthur Blvd., Apt. #51, New Orleans, La. 70114

Filed Aug. 25, 1982, Ser. No. 411,465
Int. Cl.³ F16B *1/00*
U.S. Cl. 403—387 **9 Claims**



1. A clamping system for clamping together angularly intersecting, upper and lower horizontally disposed, heavy, structural "I" beams, each having two horizontal flanges between a vertical member with the upper one of said beams resting on the lower beam with the upper flange of the lower beam con-

tacting the lower flange of the upper beam in face-to-face disposition, said system comprising:

a pair of coupling members each releaseably connectable to said upper and lower beams for clamping together the upper horizontal flange of said lower beam to the lower horizontal flange of the upper beam, each coupling member comprising:

a plurality of parallel transverse vertical plates of generally C-shaped configuration and including a slot dimensioned to fit over approximately one-half the width of said upper flange of said lower beam;

longitudinally extending plate means connected to said parallel transverse vertical plates and extending in a direction parallel to the axis of said lower beam;

horizontal bolt support plate means connected to said vertical plates in a location immediately above and adjacent said slots;

threaded bolt means threadably mounted in threaded apertures extending vertically through said horizontal bolt support plate means so as to be movable into forceful clamping contact with the upper surface of the upper flange of the lower beam;

longitudinally extending cantilever plate means extending over one side of the upper surface of the lower flange of the upper beam;

lower flange clamp bolt means mounted on said cantilever plate means for vertical movement into forceful clamping contact with the upper surface of the lower flange of said upper beam;

said coupling members of said pair being arranged on the upper flange of the lower beam in back-to-back mirror image relationship to each other and including connection permitting means for permitting said coupling members of said pair to be mechanically connected together; and

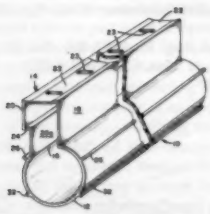
further including a second pair of coupling members identical to said first pair of coupling members and mounted on the opposite side of the upper beam and on the upper flange of the lower beam in mirror relation to the first pair of coupling members.

4,490,067

MODULAR DRAIN SYSTEM

Donald E. Dahowski, York, Pa., assignor to Quaker Plastic Corporation, Mountville, Pa.

Filed Dec. 17, 1981, Ser. No. 331,842
Int. Cl.³ E01F *5/00*
U.S. Cl. 404—4 **15 Claims**



1. A below ground hollow longitudinal drain and expansion joint element adapted to be secured in the ground and embedded in concrete, said drain element receiving drainage water through the top surface and comprising:

(a) a polygonal hollow upper portion having a first transverse dimension including: (i) a substantially horizontal top surface, (ii) a left side wall and (iii) a right side wall; and

(b) a substantially cylindrical lower portion having a second transverse dimension which is uniform in diameter throughout and which is substantially larger than the said first transverse dimension of the upper portion, the interior at the top of said lower portion being in open communication with the interior of and at the bottom of said upper portion,

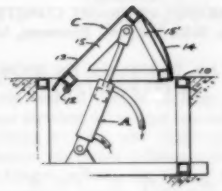
said upper portion being integrally formed with said lower portion and being relatively offset in structure so that when said top surface is positioned horizontally, one end of said top surface is in vertical alignment with one side wall extremity of said lower cylindrical portion, said longitudinal element being sufficiently resilient to absorb stresses caused by expansion and contraction of concrete in which said element is installed.

4,490,068

HYDRAULIC SAFETY BARRIER TRAFFIC-WAY CONTROLLER

Harry D. Dickinson, 1681 Larco Way, Glendale, Calif. 91302

Filed Apr. 25, 1983, Ser. No. 488,106
Int. Cl.³ E01F *13/00*
U.S. Cl. 404—6 **9 Claims**



1. A self contained vehicle traffic-way controller of retractile barrier configuration subject to upward and downward impacts and wherein actuation and control is by instantly reversible hydraulics, and including;

a barrier disposed across a traffic-way and pivoted to a frame for extension through intermediate positions to an UP position projecting as an abutment exposed to impact in the traffic-way and to a DOWN position substantially coplanar with the traffic-way,

at least one double acting cylinder and piston actuator connected between the barrier and frame and operable between a normally extended UP position of the barrier and a retracted DOWN position of the barrier,

an intermittent running motor driven pump means supplying fluid from a reservoir at a variable pressure and a volume rate complementary to the time-demand requirement of said at least one cylinder and piston actuator,

a pressure-volume accumulator open into a supply line from the motor driven pump means and storing potential energy as fluid volume under low to high pressure,

an instantly reversible valve means in a supply line between the pressure-volume accumulator and the cylinder and piston actuator and having two controlled operating positions, an UP position pressuring a lower end and exhausting an upper end of the actuator and extending said actuator, and a DOWN position pressuring the upper end and exhausting the lower end of the actuator and retracting said actuator,

a high-low pressure switch open to and responsive to accumulator pressure to close an energizing circuit to the motor at a predetermined low accumulator pressure and to open the energizing circuit at a predetermined high accumulator pressure thereby maintaining a variable pressure and proportionate volume of fluid in the accumulator,

a check valve in and preventing reverse flow in the supply line between the motor driven pump means and the pressure-volume accumulator to hold a fluid volume in the accumulator for yielding to retraction of the actuator when moving and when held to said UP position to protect both the actuator and pump and related structure from hydraulic impact,

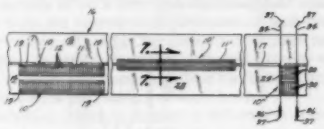
and control means switching the valve means alternately into said UP and DOWN positions.

4,490,069

PORTABLE HIGHWAY WARNING APPARATUS

Robert P. Cushman, 4601 Curtiss Dr., Virginia Beach, Va. 23455, and Robert P. Cushman, Jr., Rte. 1, Box 484, Eveleth, Minn. 55734

Filed Mar. 3, 1982, Ser. No. 354,439
Int. Cl.³ E01F 9/00
U.S. Cl. 404—15 **5 Claims**



1. A portable warning device in combination with a road having surface material thereon and multi-wheeled vehicles, wherein the portable warning device serves as an auxiliary surface, and is adapted for removeable securement to said surface material that serves as a primary surface to forewarn a driver of a multi-wheeled vehicle of a temporary or hazardous road condition ahead, wherein said portable warning device comprises

a substantially rectangular integral mat of resilient material having an upper surface spaced above and parallel to a lower road contact surface, said mat having a plurality of substantially rectangular equidistantly spaced depressions formed in said upper surface of substantially equal size, each depression having its longest dimension extended transverse and normal, both to the lengthwise dimension of said mat as it is laid on a road surface, and to the direction of travel of at least some of the wheels of said multi-wheeled vehicle, said depressions forming a series of solid rectangular-type slats therebetween and with the entire lower surface thereof in contact with the road surface material and with the upper surface of said slats lying in the same plane as each other and as said mat's upper surface, and being parallel to the road surface;

said mat having a solid integral periphery, and said depressions being uniform and parallel each other and said slats; and

means removeably affixing said mat to the surface material of the road, the lengthwise dimension of said mat being located as to extend parallel to the centerline of the road; wherein at least some of the wheels of said multi-wheeled vehicle will traverse the said depressions perpendicular to their longest dimension, so as to generate both an audible and vibrational warning to the driver of said multi-wheeled vehicle.

4,490,070

HEAVY-DUTY TRENCH COMPACTOR

Otha D. Upchurch, Millersville, and Marvin F. Bosley, Laurel, both of Md., assignors to Dumbco Inc., Beltsville, Md.

Filed Sep. 7, 1979, Ser. No. 73,562
Int. Cl.³ E01C 19/26
U.S. Cl. 404—121 **11 Claims**

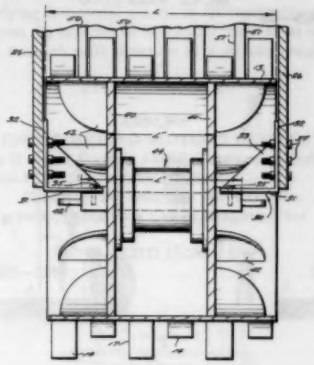
1. A compactor assembly for attachment to a crawler excavator or the like, comprising

a sheep's foot roller, having a plurality of feet extending radially outwardly from an exterior cylindrical surface thereof; said cylindrical surface having a central axis and having an axial length L, and defining an open interior volume;

an axle having a length L' less than said length L;

means for mounting said axle along said roller cylindrical surface central axis so that said axle is completely contained within the interior volume defined by said cylindrical surface;

a frame for operatively mounting said roller to a crawler



excavator or the like, said frame comprising a pair of side plates and at least one cross-plate; and

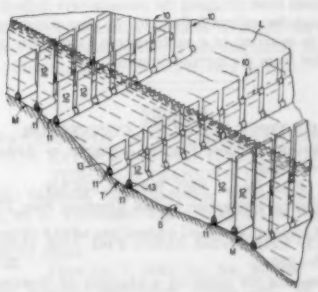
means for mounting said axle to said frame side plates so that said roller can rotate about said axis.

4,490,071

ARTIFICIAL SEAWEED AND METHOD OF ACCRETING WATERFRONTS

John P. Morrisroe, 283 Park Dr., Palatine, Ill. 60067

Filed Jan. 21, 1983, Ser. No. 459,707
Int. Cl.³ E02B 3/04
U.S. Cl. 405—24 **6 Claims**



1. The method of accreting beaches on water fronts which comprises determining the still water level of the water front, determining the profile of the bottom beneath said water to identify trough and mound undulations at selected distances outwardly from the shoreline, deploying into the water on selected mound and trough undulations separate lengths of artificial seaweed each having a continuous flexible anchor and a plurality of upstanding buoyant fingers extending from said anchor along the length thereof to form a plurality of spaced rows of the seaweed outwardly from the shoreline, regulating the heights of the fingers to maintain the tops thereof below the determined still water level and allowing nature to develop sand bars outwardly from the shoreline and build up the beach along the shoreline.

4,490,072

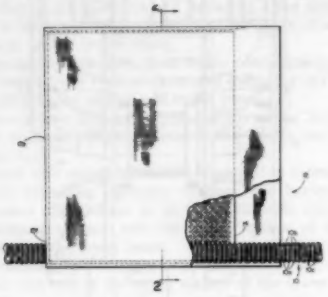
DRAINAGE DEVICE

Joseph Glasser, 15 Westwood Rd., Storrs, Conn. 06268

Filed Sep. 30, 1982, Ser. No. 430,481

Int. Cl.³ E02B 11/00

U.S. Cl. 405—45 1 Claim



1. A drainage device comprising an elongated drain pipe defining axially spaced radially outwardly extending portions which provide annular valleys therebetween, said valleys communicating with openings defined in the sidewall of the pipe to provide passageways for water to pass into the interior thereof, a generally rectangular plastic core sheet having opposing sides with alternate raised land portions and surrounding valleys, of corresponding configuration, said sheet arranged tangentially to the pipe so that said land portions contact the raised annular portions of the pipe and are separated from the said valleys in said pipe, said sheet being impervious to ground water but defining a plurality of passageways around the raised land portions thereof for water to flow through said surrounding valleys along its external surface and direct said water into the valleys of said pipe, and a non-woven plastic sheet material pervious to water and wrapped around both the core sheet and the pipe so as to prevent the surrounding fill material from plugging the passageways defined by the core sheet and the valleys defined by the pipe when the drainage device is installed in a subterranean system for draining ground water from the surrounding fill.

4,490,073

MULTIPLE FLOWLINE CONNECTOR

John E. Lawson, London, England, assignor to Armco Inc., Middletown, Ohio

Filed Dec. 1, 1981, Ser. No. 326,329

Claims priority, application United Kingdom, Nov. 27, 1981, 8135808

Int. Cl.³ E21B 33/038, 43/013; F16L 1/04, 35/00

U.S. Cl. 405—169 20 Claims

1. A connector for coupling a plurality of flowlines in a catenary bundle in fluid-flow relationship with a plurality of wellheads supported on a submerged support, the combination comprising:

a first connector member rigidly coupled in an upright position to the submerged support and including

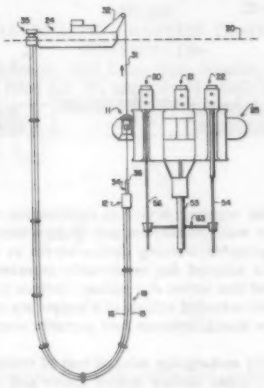
a plurality of conduits extending therethrough having first and second ends, said conduits being coupled at their first ends to the plurality of wellheads, and

an upright, hollow annular member having a first upwardly-facing open end and a second downwardly-facing open end and an orientation member on the interior thereof;

a second connector member adapted to be coupled to said first connector member and including

a plurality of conduits extending therethrough and having first and second ends, said conduits adapted to be coupled at their first ends to the second ends of said conduits in said first connector member and being coupled at their second ends to the plurality of flowlines in the catenary bundle, and

an elongated stinger adapted to be received in said hollow annular member via said second downwardly-facing open end and having an orientation member on the exterior thereof for mating with said orientation member on said first connector member to orient said conduits on said first and second connector members into a fluid-flow relationship;



a wireline extending through said hollow annular member in said first connector member and coupled to said stinger in said second connector member;

a hauling device coupled to said wireline for hauling said wireline upwardly towards the surface of the body of water so that said stinger is received in said annular member, so that said orientation members mate and so that said conduits on said first and second connector members are in a fluid-flow relationship; and

means for coupling said first and second connector members together when said conduits are in fluid-flow relationship.

4,490,074

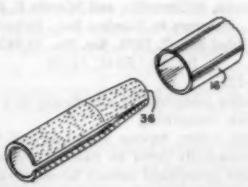
FRICTION ROCK STABILIZER AND SHEATHING MEANS, IN COMBINATION, AND METHOD OF SECURING A FRICTION ROCK STABILIZER IN AN EARTH BORE

Walter M. Chaiko, Titusville, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation-in-part of Ser. No. 224,373, Jan. 12, 1982, abandoned. This application Jun. 10, 1983, Ser. No. 502,347

Int. Cl.³ E21D 20/00

U.S. Cl. 405—259 19 Claims



1. In combination, an earth stabilizer, for stabilizing an earth structure, and sheathing means therefor, wherein:

said stabilizer comprises an elongate element for resisting movement of an earth structure from within a bore, hav-

ing a corrosive environment, formed in the earth structure to receive said element therewithin;

said sheathing means comprises means (a) conformed for sheathing fully thereabout an exterior surface and a given length of said element, and (b) for admitting said element thereinto;

said sheathing means and said element together further comprise means cooperative, following both (a) reception of said element within such a bore, and (b) admittance of said element into, and sheathing thereof by said sheathing menas, for (1) exerting a radial force against the surface of such bore, and (2) completely isolating such fully sheathed exterior surface, of said given length of said element, from the surface of such bore and sheathing said exterior surface from the corrosive environment of such bore;

said sheathing means further comprises an inner surface for forming an interface thereof with said exterior surface of said element, and an outer surface for forming an interface thereof with said surface of such bore;

said sheathing means is formed of deformable material; and

said exterior surface of said element has means, responsive to an admittance of said element into said sheathing means, within an earth structure bore, for deforming at least one of said inner and outer surfaces of said sheathing means, and for effecting a locking engagement of at least one of said inner and outer surfaces with an interfacing one of said bore and element surfaces.

4,490,075

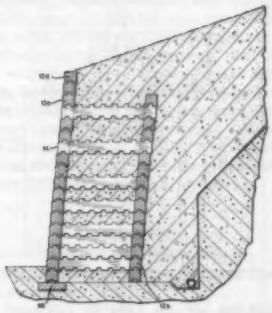
RETAINING WALL SYSTEM

Angelo Risi, and Antonio Risi, both of P.O. Box 370, Gormley, Ontario, Canada L0H 1G0)

Filed Aug. 16, 1982, Ser. No. 408,619

Int. Cl.³ E02D *29/02;* E04C *1/04*

U.S. Cl. 405—273 **22 Claims**



1. In an interlocking block for a retaining wall structure wherein like blocks are laid in horizontal courses one upon the other in end to end relation with the upper blocks interlocking with the lower blocks and displaceable therealong in sliding fit and therebeyond to overlap the adjacent ends of the lower blocks and to extend upwardly as such wall structure is erected at a selected uniform inclination to the vertical said block having an axis terminating in spaced apart end walls and bounded by generally flat top and bottom walls arranged in parallel relation to said axis and to each other and by front and rear facings extending from end wall to end wall and so separated as to provide a substantially uniform cross section throughout the axial extent of same, projecting means upstanding from said top wall and extending axially of said block between said end walls and spaced inwardly from said front facing to present an uninterrupted flat top wall portion therebetween said bottom wall having recess means therein likewise spaced inwardly from said front facing and extending axially of said block between said end walls said projecting means and said recess means having a configuration and extent so as to matingly interlock in sliding fit when such blocks are disposed in horizontal courses one upon the other and in overlapping relation to present said projecting means upwardly, said projecting means being spaced rearwardly in relation to said axis a selected extent exceeding that of said recess means whereby each overlying horizontal course is automatically uniformly set back from the next below horizontal couse so as to define a uniformly inclined wall structure at a selected angle to the vertical.

4,490,076

UNDERGROUND SUPPORT DEVICES

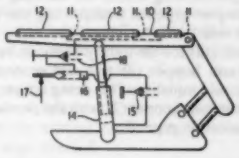
Archelaius D. Allen, Preston, England, assignor to Dobson Park Industries PLC., Nottingham, England

Filed Sep. 24, 1982, Ser. No. 423,096

Claims priority, application United Kingdom, Nov. 14, 1981, 8134376

Int. Cl.³ E21D *15/30, 15/44*

U.S. Cl. 405—289 **17 Claims**



1. An underground support device comprising:

(a) hydraulic drive means;

(b) a substantially rigid support structure movable by the hydraulic drive means between a first position in which the substantially rigid support structure is spaced away from a surface to be supported and a second position in which the substantially rigid support structure is adjacent to the said surface;

(c) Control means controlling said hydraulic drive means;

(d) flexible membrane means mounted on said rigid support structure;

(e) fluid pressure means operable to inflate the membrane, hence shaping the flexible membrane means to said surface and distributing the loading evenly thereto.

4,490,077

APPARATUS FOR CONTINUOUSLY MEASURING FLOW RATE OF FINE MATERIAL FLOWING THROUGH TRANSPORT PIPE

Katsuhiko Shimada; Koji Nakayama; Tatsuo Sato, and Kazuo Saito, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha and Sankyo Dengyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 395,969

Claims priority, application Japan, Jul. 28, 1981, 56-111053[U]; Jul. 28, 1981, 56-111054[U]; Oct. 13, 1981, 56-162022; Nov. 4, 1981, 56-175743

Int. Cl.³ B65G *53/66*

U.S. Cl. 406—14 **17 Claims**

1. In an apparatus for continuously measuring the flow rate of a fine material flowing through a transport pipe, which comprises:

a hopper (2) having a closed structure;

a fine material feeding means (7), arranged above said hopper (2), for feeding said hopper (2) with a fine material (11);

a weighing means (3) for continuously measuring the weight of the fine material (11) contained in said hopper (2);

a first communication pipe (4) for air-tightly communicating said fine material feeding means (7) and said hopper (2), said first communicating pipe (4) being adapted to intro-

duce the fine material (11) in said fine material feeding means (7) into said hopper (2);

a first valve (5), provided in said first communication pipe (4), for opening and closing said first communication pipe (4);

a valve controller (15) for controlling opening and closing of said first valve (5), said valve controller (15) being adapted to control opening and closing of said first valve (5) in response to a measured value obtained continuously by said weighing means (3) so as to keep the weight of the fine material (11) contained in said hopper (2) within a prescribed range;

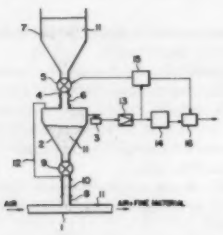
a transport pipe (1) arranged below said hopper (2);

a second communication pipe (8) for air-tightly communicating said hopper (2) and said transport pipe (1), said second communication pipe (8) being adapted to introduce the fine material (11) in said hopper (2) into said transport pipe (1);

a second valve (9), provided in said second communication pipe (8), for opening and closing said second communication pipe (8);

a carrier gas blowing means for blowing a carrier gas into said transport pipe for transporting the fine material (11) through said transport pipe (1);

an equalizer (12) for air-tightly communicating the top portion of said hopper (2) and said second communication pipe (8), said equalizer (12) being adapted to equalize the pressure in said hopper (2) with the pressure in said second communication pipe (8);



a flow rate calculating means (21) for calculating the flow rate of the fine material (11) flowing through said transport pipe (1), said flow rate calculating means (21) being adapted to continuously calculate the flow rate of the fine material (11) flowing through said transport pipe (1), on the basis of one of the following (A) and (B):

(A) a measured value (G_a) of the flow rate of the carrier gas flowing through said transport pipe (1) obtained by a flow rate measuring means (17), and a measured value (ΔP_T) of the pressure drop of a two-phase solid-gas flow which is flowing through said transport pipe (1) obtained by a pressure drop measuring means (62), said two-phase solid-gas flow comprising the fine material (11) and the carrier gas, said pressure drop being measured between two prescribed points of the transport pipe (1) in the axial direction thereof, and,

(B) a measured value of the density of the fine material (11) flowing through said transport pipe (1) obtained by a density measuring means (63), a measured value of the flow velocity of the fine material (11) flowing through said transport pipe (1) obtained by a flow velocity measuring means (64), and, the cross-sectional area of said transport pipe (1);

the improvement characterized by further comprising:

an integrator (25) for integrating calculated values (G_s) of the flow rate of the fine material (11) flowing through said transport pipe (1), which are obtained by said flow rate calculating means (21);

a correction controller (22), said correction controller (22) being adapted to calculate the total weight of the fine material (11) which is fed, during a prescribed period of time in the period for which said first communication pipe (4) is closed by said first valve (5), from said hopper (2) into said transport pipe (1), on the basis of said measured value obtained by said weighing means (3) and an output value of said valve controller (15), and, being adapted to actuate said integrator (25) during said prescribed period of time;

a correction commander (28) for informing said correction controller (22) of the starting point of said prescribed period of time;

a divider (27) for calculating a correction coefficient (k) i.e., the ratio (W/S) of a calculated value (W), obtained by said correction controller (22), of the total weight of the fine material (11) which is fed, during said prescribed period of time, from said hopper (2) into said transport pipe (1), to an integral value (S), for said prescribed period of time, obtained by said integrator (25); and,

a multiplier (23) for calculating a corrected value (G'_s) of the flow rate of the fine material (11) flowing through said transport pipe (1), by multiplying said calculated value (G_s) obtained by said flow rate calculating means (21) with said correction coefficient (k).

4,490,078

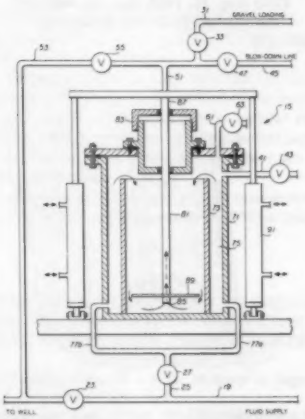
GRAVEL INJECTION APPARATUS

A. L. Armstrong, Rte. 4, Box 306, Alvin, Tex. 77511

Filed Jun. 17, 1982, Ser. No. 389,444

Int. Cl.³ B65G *53/40*

U.S. Cl. 406—114 **1 Claim**



1. An apparatus for injecting gravel into a fluid carrying flow line to form a uniform gravel and fluid slurry for use in gravel and sand packing operations, said apparatus comprising:

(a) a pressure vessel adapted to receive said gravel, said pressure vessel including a gravel container means appropriately positioned therewithin having an enclosure with an open top;

(b) a snorkel tube sealingly slidingly mounted for movement into and out of said pressure vessel, said snorkel tube including an open inner end within said pressure vessel and an outer end exterior of said pressure vessel and communicating with said flow line, and having a baffle top attached thereto adjacent said open inner end and extending outwardly therefrom towards said enclosure;

(c) means for supplying fluid to said pressure vessel, said means being positioned to supply fluid to said pressure vessel exterior of said enclosure such that said fluid flows about the exterior of said enclosure, and through said top

in a tortious path toward said open inner end of said snorkel tube;

(d) means for moving said snorkel tube into and out of said pressure vessel, said moving means including a hydraulic actuator assembly connected to said snorkel tube;

(e) means for removing fluid from said pressure vessel after said pressure vessel is emptied of gravel, said fluid removing means including a blow-down line connected to said snorkel tube, and means for supplying gas to said pressure vessel; and,

(f) means for venting gas displaced from said pressure vessel when said gravel is introduced therein.

4,490,079

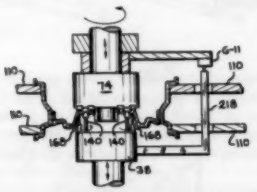
METHOD OF MAKING A WHEEL

David Trevarrow, 119 Reiniche, Horton, Mich. 49246

Division of Ser. No. 19,967, Mar. 12, 1979, Pat. No. 4,304,034, which is a continuation-in-part of Ser. No. 833,889, Sep. 16, 1979, Pat. No. 4,143,449. This application Sep. 9, 1981, Ser. No. 300,531

Int. Cl.³ B23B *39/20, 39/22*

U.S. Cl. 408—1 R **2 Claims**



1. A method of machining both side surfaces of a thin workpiece, said method comprising: supporting opposing inner and outer machining head on parallel axes for movement axially towards each other, placing the thin workpiece to be machined between said machining heads, feeding one of said heads toward the workpiece for a predetermined distance while machining the face of the workpiece, stopping the feeding and cutting action of said one of said heads and holding the head against the workpiece, feeding the other one of said heads along its axis into engagement with the opposite side surface of the workpiece, and stopping said other head at a predetermined distance from said one of said heads.

4,490,080

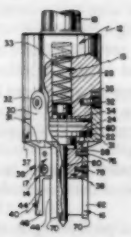
HOLE CUTTING TOOL

Mitchell Kezran, Providence, R.I., assignor to Precision Industries, Inc., Providence, R.I.

Filed Feb. 18, 1983, Ser. No. 467,584

Int. Cl.³ B23B *51/04*

U.S. Cl. 408—68 **14 Claims**



1. A hole cutting tool comprising:

a. a tool body attachable to a drive apparatus for rotating said tool in a cutting direction about an axis;

b. a cutting head attached to said body, said cutting head having upper and lower portions concentric with said axis, said lower portion being of substantially tubular configuration and defining the lower end of said tool, said cutting head having a longitudinal slot therein which extends upwardly through said lower portion from the lower end thereof and a distance upwardly through said upper portion, said slot having leading and trailing longitudinal slot edge surfaces as determined by the cutting rotation of said tool, the trailing edge surface of said slot being substantially planar and extending across the wall thickness of said tubular lower portion, the trailing edge surface of said slot in both said upper and lower cutting head portions being in a plane which diverges at least slightly in its inward extent relative to an adjacent radial plane of said cutting head which intersects said trailing edge surface;

c. an elongated cutting insert having a substantially planar seating surface which is received in abutting relation with said trailing edge surface in both said upper and lower cutting head portions and having a leading edge as determined by the cutting rotation of said tool which includes a substantially planar cutting surface, said cutting surface being disposed in substantially radial relation to said cutting head and in spaced relation to said slot leading edge surface, the terminal portion of said insert projecting slightly beyond the terminal end of said cutting head, the terminal end of said insert slanting at least slightly upwardly from the cutting surface edge thereof to the seating surface edge thereof;

d. inner positioning means disposed in said head upper portion engaging the upper portion of said insert to prevent inward movement thereof in said head; and

e. means engaging the leading edge of the upper portion of said insert to urge said insert into engagement with the trailing edge surface of said slot and thereby retain said insert in said slot.

4,490,081

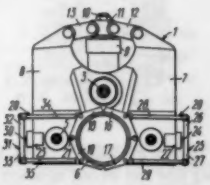
ARRANGEMENT FOR REMOVING BURRS IN BUTT RESISTANCE WELDING OF WORKPIECES

Sergei I. Kuchuk-Yatsenko; Valery G. Krivenko; Mikhail V. Bogorsky; Ivan L. Lazebny; Fedor K. Porkhun; Vasily A. Sakharnov, and Vitaly T. Cherednichok, all of Kiev, U.S.S.R., assignors to Institut Elektrosvarki Imeni E.O. Patona Akademit Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

Filed Apr. 13, 1982, Ser. No. 368,056

Int. Cl.³ B23D *1/08*

U.S. Cl. 409—300 **3 Claims**



1. Apparatus for removing burrs in butt welding of elongated workpieces, comprising a body constructed in the form of a clamp having mating workpiece-engaging jaws, said jaws each having first and second ends, a clamping cylinder coupled to said jaws proximate said first ends, a pair of elongated deburring cutters on each of said jaws proximate said second ends, a common pivot point on each of said jaws, means for mounting an end portion of each cutter of one of said pairs on said common pivot point, and piston and cylinder drive means for pressing said cutters to the workpiece surface in conformity with the shape thereof, said drive means including at least one hydraulic cylinder symmetrically mounted on each of said

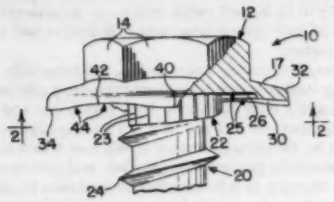
jaws and having piston rods operatively connected to the respective cutters of each pair to effect pivoting of said cutters about their respective common pivot point.

4,490,082

FASTENER HAVING AN AXIALLY AND RADIALLY UNDULATING FLANGE

Gerald D. Barth, S. Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 8, 1983, Ser. No. 502,380
Int. Cl.³ F16B 31/02
U.S. Cl. 411—185 9 Claims



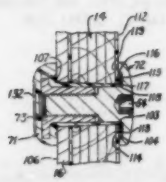
1. A screw comprising: a threaded shank, a head at one end of said shank adapted to accommodate a driving tool, said head including an integral flange, radial and axial undulations on said flange, said undulations creating non-abrupt variations in radial and axial profiles of said flange, said variations in axial profiles of said flange defining a recess in said head, said radial and axial undulations occurring with the radial outward peaks and the axial downward peaks at coincident locations on said flange, said undulations adapted to interfere with a workpiece upon threaded advancement of said screw into said workpiece, whereby torque required to strip said screw is increased.

4,490,083

SEALING CAPPED NUT AND BOLT THEREFOR

Edward J. Rebish, Euclid, Ohio, assignor to Russell, Burdsall, & Ward Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 111,038, Jan. 10, 1980, abandoned. This application Aug. 27, 1981, Ser. No. 296,574
Int. Cl.³ F16B 33/00, 37/00, 37/14
U.S. Cl. 411—338 19 Claims



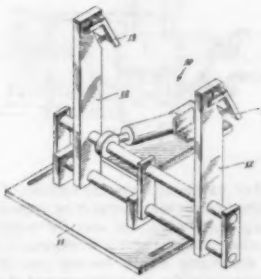
1. A fastener system for sealing and fastening apertured articles comprising first and second members providing interfitting means operable when said members are assembled to secure said members together, each member providing a clamping face which cooperate when said members are assembled and interconnected by said interfitting means to engage and clamp against opposite surfaces of said articles, one of said members providing a reduced diameter shank extending from its clamping face proportioned to extend into said apertures in said articles and providing a single-layer tubular end having a substantially uniform diameter formed of deformable material, said shank having a length greater than the length of said apertures in said articles, said clamping face on the other of said members providing roll hem forming means operating when said members are assembled to radially deform said tubular end and produce a radially extending peripherally continuous rolled hem having at least two radially extending layers which engages the adjacent surface of said article around said aperture and is clamped into sealing engagement therewith by said clamping face of said other member, said one member operating to produce a seal with the adjacent surface of said articles around said apertures and in cooperation with said shank thereof and said hem to create a full seal of said apertures when said members are assembled.

4,490,084

WIRE TRANSFER MECHANISM

John C. Collier, York, and Richard H. Davis, Marysville, both of Pa., assignors to Burndy Corporation, Norwalk, Conn.

Filed Nov. 21, 1980, Ser. No. 209,247
Int. Cl.³ B65H 57/26
U.S. Cl. 414—222 5 Claims



1. In an automated system for the manufacture of electrical components which includes a wire cutting station, a wire stripping station and a crimping press, the improvement comprising:

a wire transfer mechanism which is adapted for automatic cyclic operation in conjunction with a wire cutting apparatus, a wire stripping apparatus and a crimping press, said transfer mechanism having a base positionable relative to a wire feed assembly and a wire crimping assembly;

a plurality of transfer arms pivotably mounted on said base;

means for coordinated movement of said transfer arms between a wire pickup station of said wire feed assembly and said wire crimping press;

releasable gripper means including a notch structure operatively associated with the proximate end of each transfer arm for engaging a length of wire at the wire pick-up station so as to prevent relative motion of the wire in a direction normal to the direction of the wire and yet allowing for the axial movement thereof;

said gripper means adapted for receiving a length of wire from the pick-up station of the wire feed assembly, transferring said length of wire directly to said crimping station, andd thereafter releasing said length of wire, upon the return stroke of the transfer arm, at a wire collection station; and

actuator means, for performing in repeatable sequence, the pick-up, transfer, and release of the length of wire from the gripper means and the repetition of such cycle whereby, the receiving, transfer and release of said length of wire by said gripper means of the wire transfer mechanism is performed without bending of the length of wire.

4,490,085

VEHICLE HOISTING DEVICE PARTICULARLY FOR USE IN GARAGES

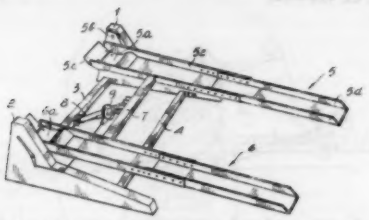
Giuseppina Adami née Michelini, Volta Mantovana, and Giuseppe Zoccatelli, Goito-Cerlongo, both of Italy, assignors to A.F.G. S.R.L., Volta Mantovana, Italy

Filed Oct. 13, 1981, Ser. No. 310,937

Claims priority, application Italy, Oct. 16, 1980, 18121 A/80; Feb. 27, 1981, 19610/81[U]; Mar. 31, 1981, 18106 A/81; Jun. 4, 1981, 19627/81[U]; Sep. 10, 1981, 18122 A/81

Int. Cl.³ E04H 6/12

U.S. Cl. 414—229 6 Claims



1. A vehicle hoisting device particularly for use in garages, comprising two ramps rigidly connected and intended to support at least one of the wheel pairs carried on one axle of a vehicle and having at least one single-acting hydraulic cylinder operative to cause their rotation up from the position with the free end resting on the floor,

floor engaging means having structural formations for pivotally supporting said ramps substantially near one end thereof and automatic distributing valve means located in the hydraulic system and cooperating with safety means against the unintentional lowering of the ramps, wherein

the safety means against the unwanted lowering of the ramps comprise two plates made rigid with the cylinder and arranged in normal planes to the axis thereof, having each a plurality of bores in respective facing relationship, and columns rigid with the piston and adapted to slide through said bores and having a length which can be varied as a function of the piston stroke length such that the free end, with the piston at its top stroke limit, is located within the bores formed in the closest plate to the cylinder end wherefrom said piston extends, and in that it further comprises, intervening between the two fixed plates, a third movable plate having an identical plurality of bores, adapted for rotation about the cylinder axis between two end positions whereat the plurality of bores provided therein are respectively lined up and disaligned with the plurality of bores of the fixed plates, there being provided a first constantly active member adapted to produce the rotation of said third plate toward the bore disalignment position, and there being provided a second member activated by manual control and adapted to produce a reverse rotation against the action of the first member.

4,490,086

SELF PROPELLED LOAD DISTRIBUTOR VEHICLE

Dieter G. Lück, Johannesburg, South Africa, assignor to General Mining Union Corporation Limited, Johannesburg, South Africa

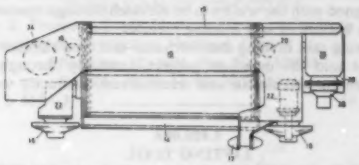
Filed Jan. 5, 1982, Ser. No. 337,161

Claims priority, application South Africa, Jan. 9, 1981, 81/0124; Sep. 4, 1981, 81/6142

Int. Cl.³ B60P 1/56

U.S. Cl. 414—376 9 Claims

1. A self-propelled load distributor rail vehicle comprising an open top body having a discharge opening in its underside, at least one door for opening and closing the opening in the underside of the body, means on the body for opening and closing the door, four rail wheels which are rotatable about vertical axes with each wheel including an inverted substantially conical tread surface which is outwardly and upwardly inclined from a central boss which during straight travel of the vehicle is located on the inside of and spaced from the side of the rail which carries it so that the vehicle may move transversely to the rails in a curve while the tread surfaces of the wheels remain in contact with the rails, and hydraulic means on the body for driving at least one of the wheels and operating the door opening and closing means, the hydraulic means including a hydraulic wheel driving motor, a hydraulic fluid



pressure accumulator, a hydraulic fluid reservoir, a hydraulic control circuit for controlling operation of the door opening and closing means and the wheel-driving motor including means providing signals for indicating the location of the vehicle, means providing signals for indicating an empty or loaded condition of the vehicle, valve means responsive to signals from the location indicating means and the load indicating means for controlling the operation of the hydraulic means, and hydraulic pump means for charging the accumulator with hydraulic fluid under pressure from the reservoir when the vehicle is stationed at a loading position.

4,490,087

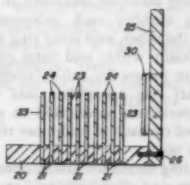
ELEVATING JIG FOR SEMI-CONDUCTOR WAFERS AND SIMILAR ARTICLES

John F. Ryan, San Diego, and John G. Wright, Poway, both of Calif., assignors to Northern Telecom Limited, Quebec, Canada

Filed Jul. 27, 1982, Ser. No. 402,264

Int. Cl.³ B65G 65/30

U.S. Cl. 414—417 6 Claims



1. An elevating jig for lifting selected semiconductor wafers from a wafer holding member carrying a plurality of wafers in a parallel closely spaced array, comprising:

a base member;

a plurality of spaced parallel slots in said base member;

a plurality of removable upwardly extending lift members positioned in said slots at predetermined positions corresponding to the positions of said selected semiconductor wafers in said wafer holding member, each of said lift members including means for supporting a wafer;

a locating member at one end of said base member, said locating member having a predetermined location relative to said slots;

said predetermined positions of said lift members being such that said lift members project up through openings in a lower portion of said wafer holding member when said

holding member is positioned on said base member, to lift said selected wafers in said holding member.

6. A method of elevating selected semiconductor wafers mounted in a semiconductor wafer holding member by use of an elevating jig having a base member, a plurality of spaced parallel slots in the base member, a pluarlity of removable, upwardly extending lift members, and a locating member at one end of the base member, said method comprising:

positioning said lift members in slots at predetermined positions corresponding to the positions of the semiconductor wafers to be elevated;

positioning said semiconductor wafer holding member against said locating member so that said lift members are aligned with the wafers to be elevated through openings in the bottom of said holding member; and

lowering said holding member onto said base member such that said lift members project upwardly through said openings and elevate said selected semiconductor wafers.

4,490,088

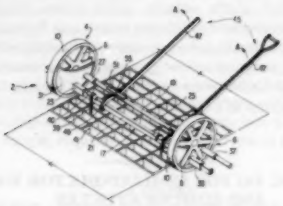
LIFTING TOOL

Alfred B. Castle, 4104 Maryland Ave., Bethesda, Md. 20816

Continuation-in-part of Ser. No. 131,690, Mar. 19, 1980, Pat. No. 4,321,003. This application Mar. 23, 1982, Ser. No. 361,044

Int. Cl.³ B62B *1/14*

U.S. Cl. 414—457 **8 Claims**



1. A tool for vertically lifting and maneuvering objects, comprising:

(a) support means having at least two axially spaced-apart ring assemblies defining an object receiving zone between said assemblies, each ring assembly having a center of rotation, each ring assembly including an inner and outer concentric ring member each independently rotatable with respect to the other, said inner ring member being at least partially axially within said outer ring member;

(b) first connecting means for axially connecting together said spaced-apart ring assemblies, said first connecting means being operatively connected to a first receiving member mounted on each of said inner ring members at a first connection point;

(c) second connecting means for axially connecting together said spaced-apart ring assemblies, said second connecting means being operatively connected to a second receiving member mounted on each of said inner ring members at a second connection point, said first and second connection points in each ring assembly being radially spaced from said center of rotation and being spaced from each other, said first and second connecting means being arranged in spaced parallel configuration with respect to each other;

(d) object engaging means mountable on said first connecting means for connecting said first connecting means and said object together;

(e) lever means operatively engageable with said first and second connecting means for rotating simultaneously said inner ring members, said lever means fulcruming about said second connecting means and urging said first connecting means to raise said object engaging means, said outer ring members remaining substantially stationary when said inner ring members are rotated;

said ring assemblies, first and second connecting means, and object engaging means cooperating to vertically lift said object into a raised position in said object receiving zone upon rotation of said inner ring members, said object being transportable in said raised position upon rotation of said outer ring members relative to said inner ring members.

4,490,089

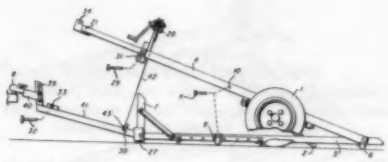
TRAILER

T. L. Welker, 2109 Kessler Ct., Dallas, Tex. 75208

Filed Aug. 26, 1982, Ser. No. 411,914

Int. Cl.³ B60P *1/04*

U.S. Cl. 414—483 **7 Claims**



1. An improved trailer comprising a main structural assembly having

A. An offset axle with two ends,

B. A first wheel mounted directly on one end of said offset axle and another wheel mounted directly on the remaining end of said offset axle,

C. A frame assembly having a tongue portion, rearward extensions of said tongue portion and a rear member connecting said tongue portion and rearward extensions into a semi-rigid frame, said rear member having a portion adapted to form one portion of a hinge, and

D. A pair of springs, one of said pair providing a pivotable connection between one of said rearward extensions and a non-offset portion of said offset axle immediately adjacent one of said wheels and the other of said pair of springs providing a pivotable connection between the other of said rearward extensions and a non-offset portion of said offset axle immediately adjacent the other of said wheels,

the locations of said pivotable connections being a predetermined distance forward of said rear member to form a lever, the fulcrum of said lever being located at said pivotable connections with said axle; a main load supporting assembly having

A. A main load-supporting member,

B. A transverse support member, and

C. A rear portion adapted to form another portion of said hinge, said hinge pivotably connecting said rear portion with said rear member; and means including said axle when acting as a fulcrum effective when the forward end of said main structural assembly is in its lowered position to position said main load supporting assembly in a raised condition and when in its raised position to position said main load supporting assembly in a lowered position parallel to and in contact with the ground.

4,490,090

APPARATUS FOR TRANSPORTING FRAMES

Albert R. St. Clair, Lilburn, Ga., assignor to Simmons U.S.A. Corporation, Atlanta, Ga.

Filed Apr. 16, 1982, Ser. No. 369,317

Int. Cl.³ B65H *5/12*

U.S. Cl. 414—567 **18 Claims**

1. An apparatus for transporting an item from a first station to a second station, comprising:

a frame assembly;

first and second substantially parallel transfer arms mounted to said frame assembly and extending therefrom;

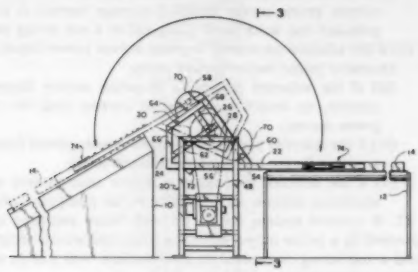
means for moving said frame assembly back and forth about

an axis, thereby causing said transfer arms to traverse an arcuate path;

counterbalancing means mounted to said frame assembly for counterbalancing at least a portion of the weight of said transfer arms; and

first and second clamping means respectively mounted near the ends of said first and second transfer arms, said clamping means opposing each other and positioned a desired distance from said frame assembly;

at least one of said clamping means including a linkage arm



pivotably mounted to one of said transfer arms, a swivel arm pivotably mounted to said linkage arm, and means for moving said linkage arm about the point at which it is pivotably mounted to said one of said transfer arms, thereby moving said swivel arm towards or away from said one of said transfer arms to grip or release an item positioned between said transfer arms;

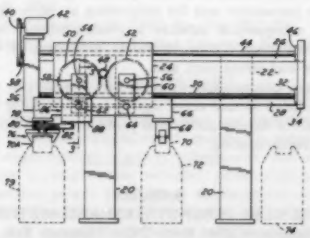
said linkage arm and said swivel arm both having a U-shaped cross-sectional configuration, said linkage arm partially enclosing said one of said transfer arms and said swivel arm partially enclosing said linkage arm.

4,490,091

SLAVE ROTATE MECHANISM FOR MECHANICAL HANDS OF GANTRY TYPE TRANSFER SYSTEM

John H. Brems, Apt. 16-D, 2800 S. Ocean Blvd., Boca Raton, Fla. 33432

Filed Mar. 29, 1983, Ser. No. 480,069
Int. Cl.³ B65G *47/34*
U.S. Cl. 414—749 **11 Claims**



1. In a workpiece transfer system in which a transfer beam, supporting mechanical hand means, is translated in a generally inverted U-shaped transfer path, created principally by the superposition of the linear motion of a supporting carriage on the rotary motion of crank arm means rotatably mounted on said carriage and rotatably connected to and supporting said transfer beam, that improvement which comprises means for rotating said mechanical hand means with respect to said transfer beam as said transfer beam traverses said transfer path, comprising:

(a) means for mounting said mechanical hand means for rotation on said transfer beam,

(b) mechanical drive means mounted on said transfer beam, and driven by said crank arm means,

(c) rotation drive means interconnecting said mechanical drive means and said mechanical hand means,

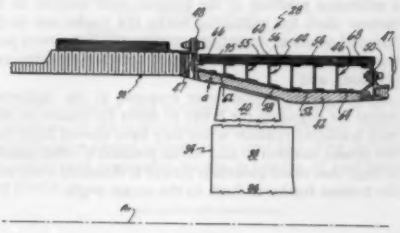
whereby the rotation of said crank arm means relative to said transfer beam drives said mechanical hand means in rotation with respect to said transfer beam, through said mechanical drive means and said rotation drive means.

4,490,092

CONTAINMENT STRUCTURE

Emile J. Premont, South Hadley, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1981, Ser. No. 332,695
Int. Cl.³ F01D *21/00*; F01B *25/16*
U.S. Cl. 415—1 **16 Claims**



1. A method of forming a containment case for a rotary machine having a working medium flow path to contain particles having an axial component of velocity and a radial component of velocity which includes the steps of:

forming a first structure for supporting and positioning a fabric about said working medium flow path;

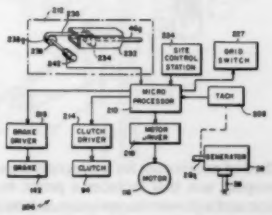
wrapping a fabric about the first structure under tension such that the installed length of the fabric is greater than the free length of the fabric.

4,490,093

WINDPOWER SYSTEM

Allan Chertok; John Gjertsen, Sr., both of Bedford, and Louis Manfredi, Watertown, all of Mass., assignors to U.S. Windpower, Inc., Burlington, Mass.

Filed Jul. 13, 1981, Ser. No. 282,965
Int. Cl.³ F03D *7/04*
U.S. Cl. 416—26 **5 Claims**



1. A windpower system comprising

A. a support,

B. a turbine shaft rotatively mounted to the support,

C. a turbine having variable pitch blades rotatively mounted to a hub connected to one end of the turbine shaft,

D. an induction generator coupled to the turbine shaft and

for producing rated output power, the speed of said generator being indicative of the output power from the generator,

E. means for monitoring the speed of the generator and producing a signal indicative of said speed,

F. a control shaft rotatively mounted to the support,

G. means for moving the pitch angle of the blades in response to the relative rotation of the control shaft and the turbine shaft,

H. means for varying said relative rotation in response to changes in the torque developed by the turbine shaft,

I. monitoring means for controlling rotation of the control shaft so that the generator produces maximum output power when wind speed is below the machine's rated wind speed, and no more than rated output power when wind speed exceeds rated wind speed,

J. a brake acting between the support and the control shaft so that by engaging the brake, the blades can be moved to their fully feathered position solely by the torque developed by the rotating turbine,

K. means responsive to the total angular displacement from a reference position of the control shaft relative to the turbine shaft for indicating when the blades are in the featured position, a start-up position, the full-power position and a so-called scram position between the latter two positions, and

L. control means operative in response to the indicating means for engaging the brake to move the blades to their fully feathered position when they have moved from their full-power position to said scram position if wind speed is so high that rated generator power is sustained even with the turbine feathered back to the scram angle.

4,490,094

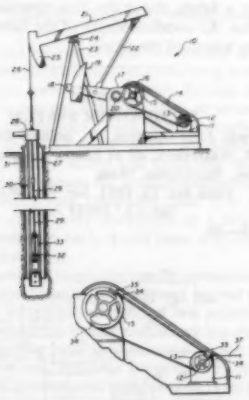
METHOD FOR MONITORING AN OIL WELL PUMPING UNIT

Sam G. Gibbs, 2064 Market St., Midland, Tex. 79703

Filed Jun. 15, 1982, Ser. No. 388,677

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—42 **29 Claims**



1. A method of monitoring for correction the operation of an oil well pumping unit that includes a prime mover having a rotating rotor and a power transmission unit and which reciprocates a rod string including a polished rod, said string being connected to a subsurface well pump, which comprises:

(a) determining prime mover rotor instantaneous speeds of revolution for revolutions turned during the period of a complete or predetermined portion of a reciprocation cycle of the said pumping unit,

(b) applying all or selected instantaneous speeds of revolution from step (a) to determine the value of at least one parameter of pumping unit performance for the said period, said parameter being selected from the group consisting of prime mover power output, prime mover modified average current, prime mover power input, prime mover thermal current, prime mover power factor, power transmission unit maximum torque, and total polished rod work, and

(c) comparing the parameter value determined in step (b) to a previously established value for the same selected parameter, to detect whether there exists between such values a relationship predetermined indicative of:

(i) if the selected parameter is one of prime mover power output, prime mover modified average current or total polished rod work: well pump off or a rod string part;

(ii) if the selected parameter is prime mover power input: an excessive prime mover power input;

(iii) if the selected parameter is prime mover thermal current, to detect: an excessive current load for the prime mover;

(iv) if the selected parameter is prime mover power factor: a power factor below an established level;

(v) if the selected parameter is power transmission unit maximum torque: an imbalance in the pumping unit.

27. A control system for an oil well beam pumping unit powered by a prime mover having a rotor and which reciprocates a rod string connected to a subsurface well pump, said system comprising:

(a) sensor means for sensing complete revolutions of said rotor and generating a signal indicative of each such revolution;

(b) expressor means, communicative with said sensor means and responsive to each said signal, for producing an expression of the instantaneous speed of each such revolution;

(c) memory means, communicative with said expressor means, for remembering values, each corresponding to a specific instantaneous speed of revolution value, in a set of values indicative of a selected parameter of prime mover performance;

(d) computative means, communicative with said memory means and said expressor means, responsive to all or selected said expressions of instantaneous speeds of revolution sensed during a complete or predetermined portion of a reciprocation cycle of said pumping unit, for accessing said remembered parameter values and for determining the average of all such accessed parameter values during said period;

(e) comparator means, communicative with said computative means, for comparing said average of said accessed parameter values to a value previously established for the same parameter and for outputting an error signal when said comparison detects a predetermined relationship between such compared values indicative of well pump off or rod string part, and

(f) means, communicative with said comparator means and responsive to said error signal, for outputting an execute signal for de-energizing said prime mover to stop pumping unit reciprocation.

4,490,095

OILWELL PUMP SYSTEM AND METHOD

Paul B. Soderberg, 1716 Huge Oaks, Houston, Tex. 77055

Filed Nov. 19, 1981, Ser. No. 308,847

Int. Cl.³ F04B *47/08*

U.S. Cl. 417—46 **8 Claims**

1. A system for pumping liquid from a well suitable for use with a well capable of producing both gas and liquid, comprising:

a string of production tubing mounted within the wellbore;

pump means sealably mounted within said tubing and including a chamber for receiving well fluids through port means and a reciprocating means in said chamber;

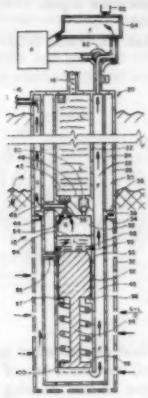
vent means in said chamber for venting gas and vapor to the

surface and including a vent valve which closes only when said chamber is substantially void of gas and vapor;

check valve means interconnecting said chamber and said production tubing for permitting fluid flow from said chamber during the power stroke of said reciprocating means;

means for detecting when said chamber is substantially void of gas and vapor;

means for closing said vent means when said chamber is substantially void of gas and vapor;



means for closing said port means when said chamber is substantially void of gas and vapor;

means for actuating the power stroke of said reciprocating means when said chamber is substantially void of gas and vapor to force the well liquids in said chamber through said check valve means; and

means for returning said reciprocating means to its at rest position.

4,490,096

PUMP SYSTEM FOR LIQUID/SOLID MATERIALS WITH BALANCED OUTPUT

Frederick J. Box, St. Albans, England, assignor to Hands-England Drilling Limited, Hertfordshire, England

PCT No. PCT/GB82/00335, § 371 Date Jul. 22, 1983, § 102(e) Date Jul. 22, 1983, PCT Pub. No. WO83/01983, PCT Pub. Date Jun. 9, 1983

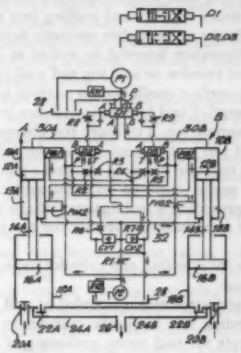
PCT Filed Nov. 25, 1982, Ser. No. 522,376

Claims priority, application United Kingdom, Nov. 25, 1982, 8135494

Int. Cl.³ F04B 9/10, 15/02

U.S. Cl. 417—342 **19 Claims**

1. A pump system comprising at least two pumping cylinders in each of which a displacement member is reciprocably movable, an equal number of power cylinders in each of which a power piston is reciprocably movable, piston rods connecting the respective power pistons and displacement members, first valve means associated with said pumping cylinders and arranged so that as each displacement member moves in one direction material to be pumped is drawn into the associated pumping cylinder from a source and as each displacement member moves in the other direction it forces the indrawn material into delivery means, pipe means connecting the annular chambers of each of the power cylinders between the power piston and the end of the cylinder through which the piston rod passes, said pipe means forming part of a closed loop circuit which is connected to a source of pressurised fluid, and control means governing the flow of the pressurised fluid in said closed loop circuit such that the power pistons and displacement members are retracted faster than they move forwards and such that before any one displacement member finishes its forward movement the other or another displacement member commences its forward movement whereby a smooth delivery of pumped material is obtained, wherein said control means comprises sensing valve means associated with



each power cylinder and arranged to be actuated at at least two positions of the power piston within the power cylinder, and check valve means connected to vent and close the closed loop circuit and responsive to the actuation of said sensing valve means.

4,490,097

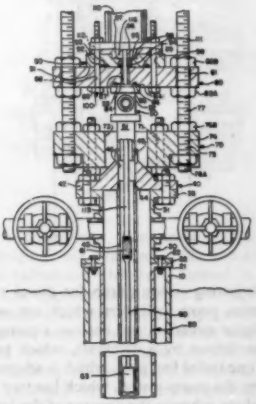
HYDRAULIC PUMP DRIVING UNIT FOR OIL WELLS

Thomas A. Gilbertson, 216 Sandringham, N., Moraga, Calif. 94566

Continuation-in-part of Ser. No. 237,366, Feb. 23, 1981, abandoned. This application Jul. 25, 1983, Ser. No. 517,325

Int. Cl.³ F04B 47/04

U.S. Cl. 417—401 **10 Claims**



1. In an oil well pumping apparatus which includes a submerged reciprocating pump mounted at the well bottom in a tubing arrangement communicating with the wellhead and positioned generally concentric with the well casing, a sucker rod string extending through said tubing arrangement and connected in driving relation with said pump, and a tubing hanger mounted to said well casing for holding said tubing arrangement, a pump driving unit comprising:

a hydraulic cylinder including a cylinder rod, a mounting

flange, an in/out fluid line, and a first cylinder rod sealing means positioned within said mounting flange to preclude leakage of hydraulic fluid around said cylinder rod as it moves in and out through said mounting flange;

a pumping tee mounted on top of said tubing hanger and having a top end wall with an aperture therethrough;

an integral cylinder support and stuffing box assembly including a cylinder support plate assembly having a bottom surface configuration adapted to mount in fluid sealing and registered relation on said top end wall of said pumping tee, a top surface configuration adapted to mount said mounting flange of said hydraulic cylinder in registration with said pumping tee, a cylinder rod channel extending between said top and bottom surface for admitting said cylinder rod into said pumping tee, and a second cylinder rod sealing means disposed adjacent said cylinder rod channel for providing a seal against leakage of well fluid between said reciprocating cylinder rod and said cylinder rod channel;

coupling means for coupling said cylinder rod to said sucker rod string; and

hydraulic drive/control means coupled to said in/out fluid line for operating said hydraulic cylinder to produce an operating cycle for said pump consisting of a hydraulic power upstroke and a gravity power downstroke.

4,490,098

FUEL-INJECTING PISTON PUMP FOR DIESEL ENGINES

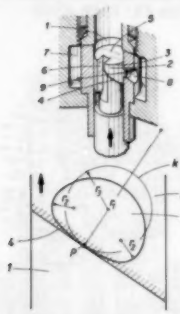
Otto Freudenschuss; Josef Morell, both of Vienna; Leopold Rollenitz, Kirchstetten, and Harald Schmidt, Vienna, all of Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Apr. 22, 1983, Ser. No. 487,508

Claims priority, application Austria, Apr. 27, 1982, 1628/82

Int. Cl.³ F02M *59/26*

U.S. Cl. 417—499 **1 Claim**



1. A fuel-injecting piston pump for diesel engines, which pump comprises pump cylinders which are associated with respective engine cylinders and enclose a pump piston that is adapted to be driven by a camshaft, which pump cylinders have at least one radial fuel port, which is adapted to be closed and opened by the pump piston, which has two axially spaced apart valve edges, wherein the opening of the fuel port into the pump cylinder has in that region which during the discharge stroke of the pump is first reached by the opening valve edge has a substantially larger radius of curvature in the peripheral direction than in the adjacent lateral regions and said opening and said opening valve edge have a common tangent at that point of said opening which is first reached by said opening valve edge during the discharge stroke of the pump, characterized in that the opening (9) of the fuel port (8) into the pump cylinder (1) has in that region which is first reached by the opening valve edge (4) a radius of curvature (r_1) in the peripheral direction which is twice to four times the radius of curvature of a circle (k) having the same area.

4,490,099

SCROLL TYPE FLUID DISPLACEMENT APPARATUS WITH THICKENED CENTER WRAP PORTIONS

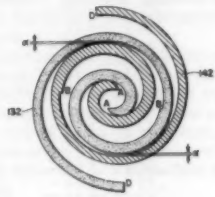
Kiyoshi Terauchi, Isesaki, and Masaharu Hiraga, Honjyo, both of Japan, assignors to Sanden Corporation, Japan

Continuation of Ser. No. 308,165, Oct. 2, 1981, abandoned. This application Apr. 3, 1984, Ser. No. 595,645

Claims priority, application Japan, Oct. 3, 1980, 55-138289; Jul. 16, 1981, 56-111366

Int. Cl.³ F01C *1/02*

U.S. Cl. 418—55 **15 Claims**



1. In a scroll type fluid displacement apparatus including a housing, a pair of scroll members, one of said scroll members fixedly disposed relative to said housing and having an end plate from which a first spiral wrap means extends into the interior of said housing and the other scroll member movably disposed for non-rotative orbital movement within the interior of said housing and having an end plate from which a second spiral wrap means extends, said first and second wrap means interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, and drive means operatively connected to said other scroll member to effect the orbital motion of said other scroll member and said line contacts whereby said fluid pockets move inwardly and change in volume, the two innermost fluid pockets eventually merging into a single pocket near the center of said wrap means, the improvement wherein the entire center portion of each of said wrap means is thicker than the remaining portion thereof, said center portions extending substantially from the inner ends of said wrap means outwardly to the portions thereof which contact one another when said two innermost fluid pockets are merged into a single fluid pocket.

4,490,100

ROTARY VANE-TYPE COMPRESSOR WITH DISCHARGE PASSAGE IN ROTOR

Michio Okazaki, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

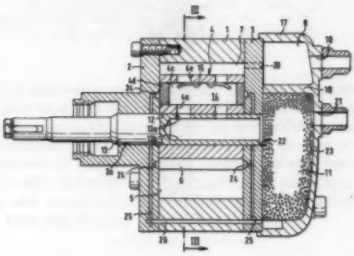
Filed Dec. 29, 1981, Ser. No. 335,390

Int. Cl.³ F04C *18/00, 29/02*

U.S. Cl. 10111984 **2 Claims**

1. A rotary vane-type compressor, comprising a stator including a hollow housing having an internal surface bounding an internal space; a rotor including a rotary body centered on an axis and having an external surface and a shaft rotatably mounted in said housing and supporting said rotary body for joint rotation, said shaft having an input end passing through said housing to the exterior of said housing and another end; means for so mounting said rotor on said stator for rotation about said axis so that said rotary body is accommodated in said internal space and said internal and external surfaces bound at least one compression chamber having a varying radial dimension as considered in the circumferential direction; means for delimiting at least one recess in said rotary body which opens into said external surface; at lease one vane at

least partially received in said recess for joint rotation with said rotary body and for reciprocation in contact with said internal surface into and out of said recess between an extended and a retracted position thereof to subdivide said compression chamber into a pressure and a suction compartment; means in said stator for admitting a medium to be compressed into said suction compartment; means for discharging the compressed medium from said pressure compartment, including a discharge opening; means defining at least one passage in said rotor connecting said pressure compartment with said discharge opening; means for lubricating said rotor and said shaft with oil; said passage-defining means including at least one substantially radial opening formed in said rotary body and communicating with said pressure compartment, at least one passage within the confines of said rotary body and extending



coaxially with said shaft and communicating said opening with said discharge opening, and least one intermediate chamber within said rotary body and communicating with said opening and with said passage; valves means situated in said intermediate chamber and operative for establishing and interrupting communication between said opening and said intermediate chamber, said housing bounding a discharge chamber communicating with said discharge opening and disposed at said another end of said shaft in communication with said passage; said discharge chamber being filled with a filter body permeable to the medium but impermeable to oil and operative for capturing oil entrained in the compressed medium as it flows through said passage-defining means; and said lubricating means including oil-conveying ducts formed in said housing and opening adjacent to said rotary body and connected to said discharge chamber.

4,490,101

INTERNALLY AXED ROTARY PISTON ENGINE

Felix Wankel, Bregenzer Strasse 82, D-8990 Lindau, Fed. Rep. of Germany

Filed Feb. 25, 1983, Ser. No. 469,625

Claims priority, application Switzerland, Mar. 3, 1982, 1302/82; Nov. 17, 1982, 6708/82

Int. Cl.³ F02C *3/02*; F03C *3/00*

U.S. Cl. 418—164 **4 Claims**

1. An internally axed crankless rotary piston engine comprising:

means forming a fixed radially inner wall and a fixed radially outer wall defining a circular annulus therebetween;

a sealing rotor having a gap which defines the terminus of said annulus at one point on its circumference;

a piston rotor having piston means including at least one piston with opposed lateral faces which moves through said circular annulus;

means defining a first opening in said inner wall;

means defining a second opening in said outer wall adjacent said sealing rotor;

one of said first and second openings comprising an inflow duct which issues into said annulus and the other of said openings comprising an outflow duct therefrom;

means defining in said sealing rotor a hollow space bounded by a pair of opening edges for passage therethrough of said piston for avoiding constricted flows, said hollow space being much larger than the kinematically necessary recess;

the speed ratio between said piston rotor and said sealing rotor being 1:2, said piston being in constant two-sided sealing contact with said opening edges of said sealing rotor while passing through said hollow space;

said opening edges of said sealing rotor having a rounded configuration whose center is always located a distance from said lateral faces of said piston equivalent to the radius of curvature of said opening edges during passage of said piston through said hollow space.

4,490,102

VOLUMETRIC SCREW COMPRESSOR

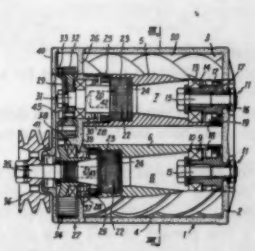
Jean-Jacques Carré, Le Raincy; Pierre Courbot, Villiers le Bel, and Roland Levrai, Stains, all of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Jul. 11, 1983, Ser. No. 512,827

Claims priority, application France, Jul. 22, 1982, 82 12803

Int. Cl.³ F04C *18/16*

U.S. Cl. 418—201 **13 Claims**



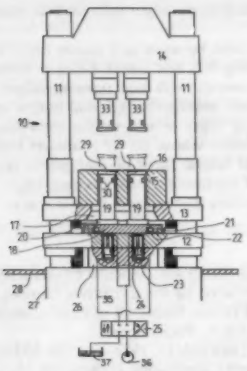
1. A screw compressor, comprising a male rotor and a female rotor respectively arranged within two intercommunicating parallel cylindrical chambers formed in a housing and closed, at their opposite axial ends, by a rear end wall and a front bulkhead, each rotor being supported and rotatingly driven by a shaft means including a first shaft end extending through said front bulkhead, said first shaft ends being provided with meshing toothed wheels for synchronously driving said rotors, each said first shaft end extending within a recess formed in the corresponding rotor and being coupled for rotation therewith within said recess, characterized in that each rotor includes a hub having a longitudinally extending transversing internal space, each said shaft means comprising a rear bearing assembly received within the corresponding end portion of said internal space and sealingly mounted on a rear shaft member fixed to said rear end wall, and a front shaft member forming said first shaft end secured to the corresponding rotor and cooperating with an annular seal received within a tubular portion of said front bulkhead which extends into said front end portion of said internal traversing space.

4,490,103

PRESS WITH EASILY EXCHANGEABLE PROOF PLATES

Willy Vogt, Zurich, Switzerland, assignor to Bucher-Guyer AG, Zurich, Switzerland

Filed Sep. 13, 1979, Ser. No. 74,974
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1978, 2841684
Int. Cl.³ B28B 3/02, 7/00
U.S. Cl. 425—193 9 Claims



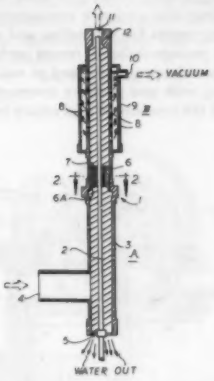
1. A press,
comprising in combination:
press die means actuatable at least in part for movement in opposite directions,
a mold movable in said opposite directions defining at least one through-going bore and being adapted to be filled on its interior with granular material,
a mold table for mounting said mold on a face of said mold table and defining a through-going aperture having a cross-sectional area exceeding the cross-sectional area of said bore, a first portion of said press die means being insertable into said bore through said aperture,
a proof plate exchangeably mounted on an end of said first portion of said press die means, and operable to be introduced into said bore, said press die means including a second portion for moving said first portion into said bore in a press stroke, and subsequently returning said first portion in a release stroke, said proof plate being normally restrained from exceeding a position wherein its topmost portion is at most flush with a topmost portion of said mold during said strokes,
supporting means releasably secured during both opposite strokes to said second portion, for supporting said first portion, and
drive means independent of said strokes and operable for lifting said supporting-means off said second portion in the direction of motion of said first portion into said bore, upon said second portion being released from said supporting means, so that said first portion projects through said bore, and said proof plate projects through said mold, and is thereby freely accessible for the purpose of being replaced.

4,490,104

APPARATUS FOR SEPARATING A LOW VISCOSITY MATERIAL FROM A HIGH VISCOSITY MATERIAL

John M. Lantz, Parkersburg, W. Va., assignor to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Nov. 22, 1982, Ser. No. 443,837
Int. Cl.³ B29B 1/00
U.S. Cl. 425—197 2 Claims



1. A two stage apparatus for separating a low viscosity material from a high viscosity material comprising a vertically disposed cylindrical barrel, a feed screw disposed within said barrel throughout substantially the entire height thereof, a first stage adapted to remove substantially all the low viscosity material from the high viscosity material and a second stage located above said first stage and adapted to remove the remainder of the low viscosity material from the high viscosity material, said first stage including a material feed port in said barrel near the bottom thereof, at least one low viscosity outlet port at the bottom of the barrel below said feed port, said first stage terminating at a restriction in said barrel, said restriction comprising a die having a plurality of longitudinal passages communicating between said first and second stages, said second stage beginning above said restriction and comprising a plurality of slots in said barrel, means for applying a vacuum to said barrel, and a discharge port located at the top of the second stage, whereby substantially all the low viscosity material is removed from the high viscosity material in the first stage and is discharged by gravity through said outlet port, and the remainder of said low viscosity material is removed in the form of vapor in the second stage of said apparatus by said vacuum and said high viscosity material is discharged devoid of low viscosity material through the discharge port at the top of the second stage.

4,490,105

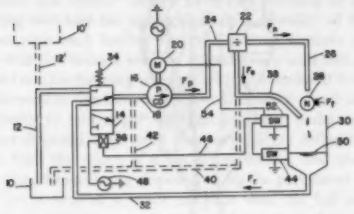
FUEL SUPPLY SYSTEM FOR A RECIRCULATING FUEL BURNER

Dale L. Hunsberger, and Frank L. Harwath, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 4, 1982, Ser. No. 385,215
Int. Cl.³ F23D 5/16
U.S. Cl. 431—65 16 Claims

1. A fuel supply system for a recirculating fuel burner, said recirculating fuel burner being of the type that requires a burner fuel flow in excess of the fuel burnt and wherein the excess fuel may be recirculated for further use, the fuel supply system including a pump having a flow capacity equal to or greater than the burner fuel flow, a fuel supply, a supply line connecting said supply to an inlet of said pump, said pump being upstream of said burner and providing fuel flow to said

burner, a collector downstream of said burner for collecting the excess fuel, a return line connecting said collector and said inlet of said pump, valve means controlling the flow from both said supply line and said return line to said inlet of said pump wherein said supply line is normally closed by said valve means and said return line is normally open, a fuel level sensing means sensing a level of fuel in said collector and operatively connected to said valve means whereby said sensing means causes said valve means to open said supply line and close said return line upon sensing said level of fuel in said collector reaching a predetermined level, and including a flow divider positioned downstream of said pump and upstream of said burner, said flow divider directing part of the flow of said pump to said burner and diverting the remainder of the flow of said pump away from said burner.

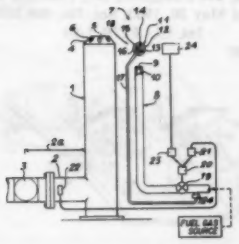


4,490,106

SAFETY DEVICE FOR IGNITING FUEL GASES DISCHARGED BY A FLARE

Flavien Lazarre, Pau, and Jean Bruneau, St-Germain en Laye, both of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Aug. 19, 1981, Ser. No. 294,371
Claims priority, application France, Aug. 28, 1980, 80 18681
Int. Cl.³ F23N *1/00*
U.S. Cl. 431—90 **9 Claims**



1. Apparatus for burning combustible gas, comprising a flare stack having an outlet and through which combustible gas flows for discharge from said outlet, a fuel gas source, and a pilot burner having a nozzle to which fuel gas can be fed from said fuel gas source and which is located adjacent to said outlet so that burning fuel gas, issuing from said nozzle as a pilot flame, ignites combustible gas issuing from said outlet, said apparatus being characterized by:

A. valve means connected between said fuel gas source and said nozzle, having

(1) a closed condition blocking flow of fuel gas from said source to said nozzle and

(2) an open condition allowing flow of fuel gas from said source to said nozzle;

B. first detector means having a connection with said valve means and responsive to flow of combustible gas through the flare stack to maintain said valve means in its open condition during such combustible gas flow but otherwise to normally maintain said valve means in its closed condition;

C. a refractory igniter located adjacent to said nozzle to be in the flow path of fuel gas issuing therefrom, said igniter being of a material which, when no heat is supplied thereto, undergoes a reduction of surface temperature of less than 50° C. per minute in the range of temperatures from 1000° C. to 700° C., to provide a thermal energy store;

D. heater means for supplying heat to said igniter to normally maintain its surface above a predetermined temperature on the order of 800° C.; and

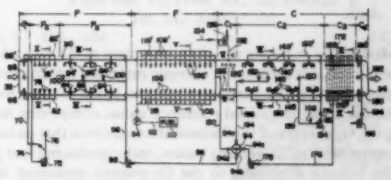
E. second detector means having a connection with said valve means, said second detector means being so responsive to a function of failure of said heater means that results in a decline of the surface temperature of said igniter to below said predetermined temperature as to cause said valve means to assume its open condition, notwithstanding absence of flow of combustible gas through the flare stack, so that failure of said heater means will not prevent ignition of combustible gas that subsequently flows through the flare stack.

4,490,107

METHOD OF PROCESSING CHARGES IN A CONTINUOUS COMBUSTION FURNACE

Kensaku Kimura, Matsudo, and Toshio Watanabe, Kita-Kyushu, both of Japan, assignors to Kurosaki Furnace Industries Company Limited, Tokyo and Kurosaki Refractries Company Limited, Kyushu, both of, Japan

Division of Ser. No. 332,240, Dec. 18, 1981, Pat. No. 4,444,557.
This application Sep. 26, 1983, Ser. No. 535,701
Int. Cl.³ F27D *3/00*; F26B *9/12*
U.S. Cl. 432—11 **15 Claims**



1. A method of heat processing charges loaded on charge loading blocks of a train of charge carrier cars travelling through a tunnel kiln elongated between an open entrance end and an open exit end and having a pair of side walls spaced apart substantially in parallel laterally of the kiln and longitudinally extending between the entrance and exit ends of the kiln and an upper wall bridging the side walls throughout the length of the kiln for forming a tunnel longitudinally extending between the entrance and exit ends of the kiln, comprising (1) passing said charges through an entrance air shutoff area in which an air curtain is formed in the tunnel in the kiln adjacent said entrance end of the kiln, (2) passing the charges through a waste-gas discharge area subsequent to the entrance air shutoff area and filled with hot waste gases being discharged from the tunnel in the kiln through the waste-gas discharge area, (3) passing the charges through a forced-circulation preheating area subsequent to the waste-gas discharge area and filled with hot gases injected into the forced circulation preheating area and forming tubulent flows therein, (4) passing the charges through a firing zone subsequent to the forced-circulation preheating area and filled with hot gases produced by high-velocity flames injected through said side walls of the kiln into the tunnel in the kiln, (5) passing the charges through a high-temperature indirect cooling area subsequent to the firing zone and having the side and upper walls of the kiln cooled with fresh air being circulated internally of the walls, (6) passing the charges through a direct cooling area subsequent to the high-

temperature indirect cooling area and filled with a mixture of fresh air and gases being recirculated into and out of the direct cooling area, (7) passing the charges through a low-temperature cooling area subsequent to the direct cooling area and being cooled by transfer of heat to finned cooling tubes through which fresh air is being circulated, and (8) passing the charges through an exit air shutoff area in which an air curtain is formed in the tunnel in the kiln adjacent the exit end of the kiln.

4,490,108

PROCESS FOR REDUCING THE OXYGEN CONTENT OF THE ATMOSPHERE IN A HEAT TREATMENT FURNACE AND HEAT TREATMENT FURNACE FOR CARRYING OUT THIS PROCESS

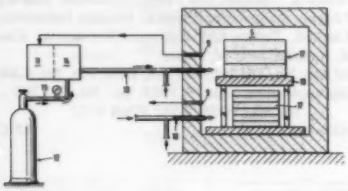
Fritz Petzi, Nuremberg, Fed. Rep. of Germany, assignor to Ludwig Riedhammer GmbH & Co. KG, Nuremberg, Fed. Rep. of Germany

Filed Mar. 14, 1983, Ser. No. 475,060

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211247; Jun. 26, 1982, 3223954

Int. Cl.³ F27B *9/04, 3/22, 9/40, 5/04*

U.S. Cl. 432—23 **11 Claims**



1. Method for reducing the oxygen content of the atmoshere of a heat treatment furnace for cermaic materials which release oxygen on heating at a particular location in the furnace to be at or below a predetermined reference value, comprising measuring the O_2 content of the furnace atmosphere at that particular location with an O_2 sensing means, and introducing fuel gas into the furnace according to the O_2 content measured, said fuel gas being introduced in regulated quantities separate from the furnace fuel stream until the oxygen content is measured as being at or below the given reference value, whereby the O_2 in excess of the reference value is combined with said fuel gas in an oxidation reaction.

4,490,109

APPARATUS FOR HEAT TREATMENT OF FINE-GRAINED MATERIAL

Karl Krutzner, Beckum, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

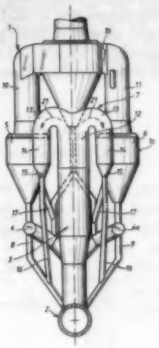
Filed May 23, 1983, Ser. No. 496,969

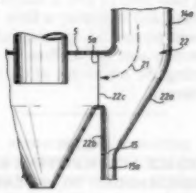
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1982, 3222131

Int. Cl.³ F27B *15/00, 7/02*

U.S. Cl. 432—106 **13 Claims**

1. In apparatus for the heat treatment of fine-grained material having a multi-stage cyclone preheater for preheating material, a kiln for final burning of the material, and a calcination zone located in a gas pipe extending between the kiln and the preheater for further heating of the preheated material before the material enters the rotary kiln, and wherein that part of the gas pipe between the calcination zone and the lowest stage of the cyclone preheater has an upwardly extending pipe section, a deflector section and a downwardly extending pipe section having an opening into the lowest cyclone stage, the improvement wherein the downwardly extending pipe section





has an extension extending downwardly beyond said opening and forming a coarse separator.

4,490,110

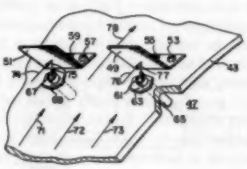
PLENUM ARRANGEMENT

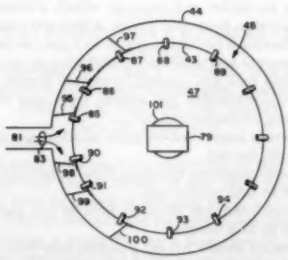
William R. Jones, 244 Hampshire Dr., Chalfont, Pa. 18914

Filed May 20, 1983, Ser. No. 496,588

Int. Cl.³ F27B *5/04*

U.S. Cl. 432—205 **1 Claim**





1. A plenum to be used with a hot zone chamber of a vacuum

furnace wherein said hot zone chamber has an outer wall, and wherein said plenum is formed to provide inert gas into said hot zone chamber comprising in combination: chamber means having an upper wall, first and second side walls, and a lower wall, said upper wall and said lower wall being secured in a sealed fashion to said first and second side walls to thereby define a sealed chamber within said walls; said lower wall being formed integral with said outer wall of said hot zone chamber and further formed to have a plurality of apertures opening into said hot zone chamber; a plurality of deflecting means with each having first and second sections and with each said first section secured to said lower wall and each said second section forming an angle with its associated first section and formed to rise from said lower wall toward and be in close proximity to said upper wall, each of said deflecting means further disposed to lie away from an adjacent deflecting means by at least the width of a deflecting means, said plurality of deflecting means being disposed along the peripheral length of said lower wall at a lesser distance than the full peripheral length of said lower wall; and said apertures lying in rows substantially parallel to the axis of said hot zone chamber and wherein said deflecting means are disposed in rows lying substantially parallel to the axis of said hot zone chamber.

4,490,111

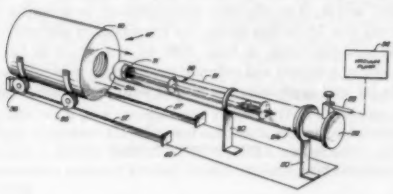
APPARATUS FOR MAKING STACKED HIGH VOLTAGE RECTIFIERS

John Yakura, Visalia, Calif., assignor to California Linear Circuits, Inc., La Mirada, Calif.

Division of Ser. No. 421,811, Sep. 23, 1982,. This application Dec. 1, 1983, Ser. No. 556,893

Int. Cl.³ F27B *5/04, 5/02;* **F27D** *5/00*

U.S. Cl. 432—205 **3 Claims**



1. A compression jig for use in stacked wafer fabrication, comprising:

an elongated rigid holding member having spaced first and second end plates, a stack of wafers being mountable adjacent said first end plate,

a movable rod extending substantially the entire length of said holding member, and having a first face plate attached to one end of said rod and adapted for pressure exerting engagement with said stack of wafers, and having a second face plate positionally adjustably affixed to said rod at the other end thereof, and

a bias spring situated between said second face plate and said second end plate so as to exert a compressive force against said stack of wafers via said second face plate, said rod and said first face plate, the position of said second face plate being adjusted to establish the extent of compression of said spring and hence the amount of force exerted against said stack of wafers.

4,490,112

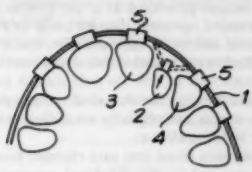
ORTHODONTIC SYSTEM AND METHOD

Susumu Tanaka, Suwa; Takehiko Daisaku, Kodaira, and Yoshihide Suda, Tokyo, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha and Takehiko Disaku, both of Tokyo, Japan

Filed Sep. 2, 1982, Ser. No. 414,189

Int. Cl.³ A61C *7/00*

U.S. Cl. 433—20 **11 Claims**



1. An orthodontic arch wire member comprising an alloy of the thermoelastic-type which undergoes a martensitic transformation caused by stress at a temperature above normal body temperature for selectively applying a variable orthodontic load in response to the difference between normal body temperature and a temperature in the mouth above normal body temperature caused by placing a temperature-affecting material having a temperature above normal body temperature in the mouth.

4,490,113

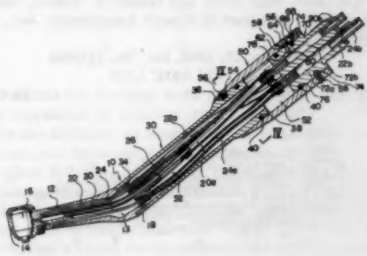
DENTAL HANDPIECE

Shosaku Kawada, Kanuma, Japan, assignor to Nakanishi Dental Mfg. Co., Ltd., Kanuma, Japan

Filed Jan. 26, 1984, Ser. No. 574,022

Int. Cl.³ A61C *1/02*

U.S. Cl. 433—104 **4 Claims**



1. A dental handpiece for connection to a dental unit comprising:

a hollow handle portion;

a powerhead assembly integrally supported on a front end of said hollow handle portion;

said hollow handle portion including a tube for supplying air under pressure centrally and axially provided to extend through a substantial length of said hollow handle portion, a water tube and exhaust tube also axially provided near and around said air tube, the rear ends of these tubes extending partially out of said hollow handle portion;

a holding sleeve fixedly held in said hollow handle, said holding sleeve having a guide slot circumferentially provided around the rear end portion of said sleeve to extend almost its periphery but less than 360°;

an interconnecting tube having its front end fixedly connected to a rear end of said tube for supplying air under pressure and its rear end air-tightly and rotatably con-

nected to a front end of a flexible air tube extending through said holding sleeve;

a flexible water tube having its front end fixedly connected to a rear end of said water tube extending through said hollow handle portion;

a flexible exhaust tube having its front end connected to a rear end of said exhaust tube;

a connecting means rotatably and releasably connected to a rear end of said holding sleeve, said connecting means having a threaded radial opening near its front periphery, a circular recess provided at a peripheral end portion thereof, threaded openings diametrically provided in said circular recess and on its opposite side, and a radial oiling filler provided in the circular recess and near the threaded opening;

a set screw held through the threaded radial opening of said connecting means and radially extending into the guide slot of said holding sleeve;

a filler cap rotatably fitted into said circular recess and held by a set screw and having a central opening to coincide with the radial oiling filler of said connecting means;

a mount insert fixedly inserted into a rear end interior of said connecting means, said mount insert having three axial and parallel openings, diametrically threaded openings provided to coincide with two threaded openings of said connecting means, and a radial oiling filler provided to coincide with the radial oiling filler of said filler cap;

a first tube extending through said first opening of said mount insert and having its front end connected to a rear end of said flexible air tube;

a second tube extending through said second opening of said mount insert and having its front end connected to a rear end of said flexible water tube; and

a third tube extending through said third opening of said mount insert and having its front end connected to a rear end of said flexible exhaust tube.

4,490,114

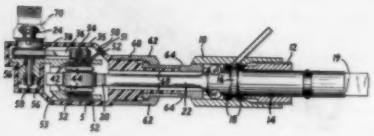
ULTRASONICALLY DRIVEN LOW-SPEED ROTARY MOTOR

Claus Kleesattel, Rego Park, and George E. Warrin, Merrick, both of N.Y., assignors to Cooper LaserSonics, Inc., Santa Clara, Calif.

Filed Jan. 21, 1980, Ser. No. 113,984

Int. Cl.³ A61C 1/02

U.S. Cl. 433—105 **11 Claims**



1. An insert for a device having a housing with means for exciting longitudinal ultrasonic vibrations, the insert comprising:

a sleeve for plugging the insert into the housing;

a vibrator supported in the sleeve, having a transducer at one end projecting toward the housing and responsive thereto for producing longitudinal ultrasonic vibrations in the vibrator, and having driving tip means at the other end for converting the longitudinal ultrasonic vibrations into elliptical motion;

at least one roller rotatably supported from the sleeve adjacent the driving tip means for axial rotation, the driving tip means tangentially engaging the roller during an arc of the elliptical motion of the driving tip means for unidirectionally rotation the roller;

tension means for providing a loading force between the roller and the driving tip;

a member rotatably supported from the sleeve; and

rotational speed reduction means coupling the roller to the member for rotating the member at a reduced rotational speed.

4,490,115

DENTAL MATERIAL COMPRISING ADDUCTS OF 3-METHACROYL-2-HYDROXYPROPYL ESTERS WITH DIISOCYANATES

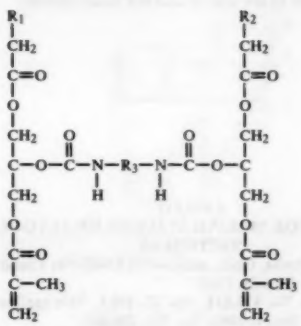
Jan A. Orlowski, Altadena; David V. Butler, West Covina, and Patrick D. Kidd, San Dimas, all of Calif., assignors to Scientific Pharmaceutical, Inc., Duarte, Calif.

Division of Ser. No. 267,608, May 27, 1981, Pat. No. 4,400,159, which is a continuation-in-part of Ser. No. 162,482, Jun. 24, 1980,. This application Apr. 18, 1983, Ser. No. 485,894

Int. Cl.³ A61K 6/08

U.S. Cl. 433—199 **11 Claims**

1. A dental material comprising polymerizable unsaturated material comprising at least about 10% by weight of, a dimethacrylate of the following chemical structure:



where R_1 and R_2 may be the same or different and are cyclohexyl or phenyl groups which may be substituted or unsaturated; and R_3 is an aliphatic, cycloaliphatic or aromatic group having 6 to 15 carbon atoms, the remainder of said polymerizable material being at least 10% by weight of at least one acrylic or a second and different methacrylic monomer acceptable for oral application associated with dental treatment.

4,490,116

DENTAL POST AND WRENCH THEREFOR AND METHOD OF RESTORING BULK TO A TOOTH ROOT THEREWITH

Allan S. Deutsch, 345 E. 80th St., New York, N.Y. 10021, and Barry L. Musikant, 211 W. 56th St., New York, N.Y. 10019

Division of Ser. No. 568,082, Jan. 4, 1984, Pat. No. 4,480,997, which is a continuation-in-part of Ser. No. 321,440, Nov. 16, 1981, abandoned. This application Jul. 18, 1984, Ser. No. 632,042

Int. Cl.³ A61C 5/00, 5/10

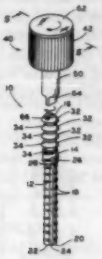
U.S. Cl. 433—215 **5 Claims**

1. In the method of restoring bulk to a tooth root with a dental post having relatively movable walls with cutting and forming threads thereon to cut threads into the tooth root,

cutting and forming threads into the tooth by threading the dental post thereinto,

spacing the walls of the dental post to enable the walls to move relative to each other to absorb fracture producing

forces on the tooth root during the cutting and the forming of the threads in the tooth root,



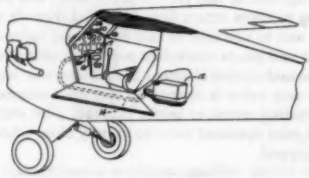
and venting the tooth root to the atmosphere to prevent the build-up of fracture producing forces in the tooth root.

4,490,117

INFLIGHT IFR PROCEDURES SIMULATOR

Loyd C. Parker, Cocoa Beach, Fla., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 11, 1982, Ser. No. 387,649
Int. Cl.³ G09B *9/08*
U.S. Cl. 434—35 **8 Claims**



1. An inflight IFR procedures simulator for generating signals and commands to built in conventional instruments provided in an airplane during actual airplane flight; said airplane being equipped with a receiver antenna means which normally supplies navigational signals from ground stations to said built in conventional navigational instruments on board the airplane such as a navigational receiver (NAV), distance measuring equipment (DME), and automatic directional finder (ADF), and a marker beacon receiver, and a transponder, and communication receiver located in said airplane, said simulator comprising:

(a) a signal synthesizer means generating predetermined simulated signals corresponding to navigational signals normally received from remote sources upon being activated;

(b) a computer means connected to said signal synthesizer means causing said signal synthesizer means to produce simulated navigational signals responsive to programs during said actual flight;

(c) means for supplying said programs to said computer means;

(d) switching network means connected to said signal synthesizer, said antenna means and said navigational instruments and communication devices, means for selectively switching said switching network means between a first position and a second position, said switching network means when in said first position connecting said conventional built in navigational instruments to said synthesizer means and disconnecting said antenna means from said built in navigational instruments and communications means, said switching network means when in said second position connecting said antenna means to said built in navigational instruments and communications means and disconnecting said synthesizer means from said built in navigational instruments and said communications means;

(e) pressure transducer means connected to said altimeter and a speed indicator for supplying electrical signals to said computer means indicating the altitude and speed of said airplane during said flight;

(f) a compass means for supplying electrical signals to said computer means indicating the heading of said airplane during said flight; and

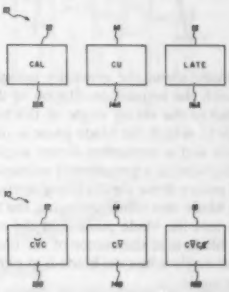
(g) said computer means upon receiving signals from said pressure transducer means and compass means thereby computing signals that are fed to said signal synthesizer means which in turn generates simulated navigational signals during said actual flight training.

4,490,118

AID AND METHOD FOR REMEDIAL READING INSTRUCTION

Geraldine L. Stewart, 14828 Green Valley Dr., Balch Springs, Tex. 75180

Filed Sep. 9, 1983, Ser. No. 530,504
Int. Cl.³ G09B *17/00*
U.S. Cl. 434—178 **2 Claims**



1. A method for teaching word recognition in a course of reading instruction in which a student is taught to identify letters of the alphabet, to identify letters as being vowels or consonants, and to recognize that combinations of letters and vowels form syllables, comprising the steps of teaching the student to recognize the following vowel (V) and consonant (C) syllable patterns: V, CV, VC, CVC, CVV and CVCE; providing a set of cards, each card within the set bearing a syllable having a vowel or a combination of one or more consonants with one or more vowels arranged according to one of the patterns identified in the previous step; instructing the student to select the card from the set which corresponds in sound with the first syllable of a selected word; and, repeating the foregoing steps until the cards assembled by the student defined the selected word.

4,490,119

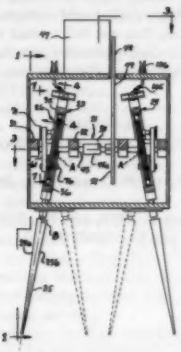
BOAT PROPULSION APPARATUS

Ronald G. Young, 2698 Camcrest Dr., Nanaimo, B.C., Canada V9T 4W4

Filed Mar. 21, 1983, Ser. No. 476,984
Int. Cl.³ B63H *1/36*
U.S. Cl. 440—14 **21 Claims**

1. A boat propulsion apparatus comprising a support structure, means for mounting the support structure on a boat, at least one swing frame mounted on the support structure for swinging movement relative thereto about a generally horizontal swing axis arranged to extend generally lengthwise of the

boat, at least one thrust blade and means mounting the thrust blade on the swing frame for swinging movement therewith about said swing axis and for turning movement relative to the swing frame about a generally upright blade axis, the thrust blade extending downwardly from the swing frame and having thrust surfaces at opposite sides of a blade plane extending lengthwise of the blade axis medially between the thrust surfaces, rotary drive means for angularly oscillating said swing frame about said swing axis to swing the thrust blade in a direction crosswise of the boat through a blade swing angle, said rotary drive means including means for angularly oscillating said thrust blade about the generally upright blade axis in timed relation with the angular oscillation of the swing frame to cyclically change the thrust angle of the blade between a zero thrust angle in which the blade plane is disposed parallel to the swing axis and a maximum thrust angle in which the blade plane is disposed at a preselected maximum angle to the swing axis, said rotary drive means being operative to turn the blade about the blade axis while swinging the blade about the swing axis such that the blade plane is at the maximum thrust angle when the blade is at the center of the blade swing angle and at zero thrust angle when the blade is at either extremity of the blade swing angle.



4,490,120

HYDRAULIC TRIM-TILT SYSTEM

James M. Hundertmark, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 20, 1982, Ser. No. 450,832

Int. Cl.³ F15B *15/22*

U.S. Cl. 440—61 **8 Claims**

1. A hydraulic system for trimming and tilting an outboard propulsion unit pivotally mounted on a support member for mounting on a boat, said hydraulic system comprising:

(A) a trim-tilt hydraulic piston-cylinder unit including a trim-tilt cylinder having closed ends, said cylinder pivotally connected to one of said propulsion unit and said support member and including a trim-tilt piston mounted in said trim-tilt cylinder and a trim tilt piston rod attached to said piston, said piston rod attached to the other of said propulsion unit and said support member;

(B) a pump having an inlet and an outlet;

(C) a reservoir for hydraulic fluid; and

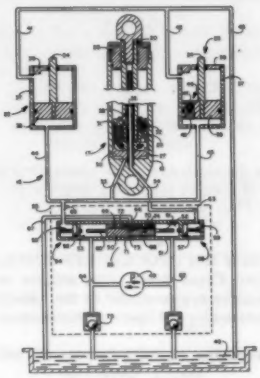
(D) a shuttle valve for connecting said outlet of said pump to said trim-tilt cylinder on one side of said trim-tilt piston and said inlet of said pump to said trim-tilt cylinder on the other side of said trim-tilt piston when said pump is operating, said shuttle valve including:

(1) a valve body including a closed valve cylinder and a piston controlled valve port;

(2) a valve spool including a pilot member mounted for reciprocation in said valve cylinder and forming a first chamber on one side of said valve spool and a second chamber on the other side of said valve spool, said first chamber connected by a first passageway to said outlet of said pump and by a second passageway to said trim-tilt cylinder on one side of said trim-tilt piston, said second chamber connected by a third passageway of said inlet of said pump and by a fourth passageway to said trim-tilt cylinder on the other side of said trim-tilt piston;

(3) a first pilot operated one-way valve in said fourth passageway, said first one-way valve normally preventing from from said trim-tilt cylinder to said second chamber and opened by said pilot member when said pump is operating to allow return flow from said trim-tilt piston cylinder unit to said inlet of said pump, said valve spool acting with said piston controlled port to provide a relief passage from said second chamber to said reservoir when said first one-way valve is opened by said pilot member; and

(4) a biasing means to assure that said pilot member allows said pilot operated valve to rapidly close when said pump is stopped.



4,490,121

MOORING SYSTEM

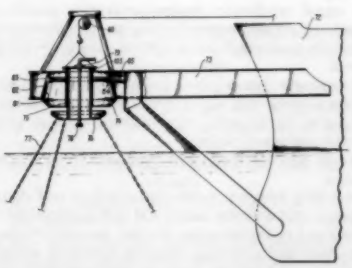
Anton Coppens, and Leendert Poldervaart, both of La Turbie, France, assignors to Single Buoy Moorings Inc., Fribourg, Switzerland

Filed Feb. 25, 1982, Ser. No. 352,080

Claims priority, application Netherlands, Feb. 26, 1981, 8100936

Int. Cl.³ B63B *21/52*

U.S. Cl. 441—5 **7 Claims**



1. In a mooring system comprising a floating device having storage capacity such as a tanker, chains for anchoring the tanker, said chains being connected to a body which is rotat-

able about a vertical axis on an arm attached to the tanker and through which body conduits extend from the sea bottom towards the tanker; the improvement in which said arm is rigidly attached to the tanker and said body comprises a buoy having its own buoyancy, which buoy can be connected to or disconnected from the arm, said buoy carrying said conduits which conduits are provided with quick couplings, the buoy being of substantially conical shape and having a circumferentially extending groove for the engagement of a quick connecting coupling comprising releasable locking means carried by said arm, said buoy with its conical outer face fitting into a corresponding recess of the arm and being held up out of the water by the arm when coupled to the arm and floating on the water surface when uncoupled from the arm.

4,490,122

PROCESS FOR MANUFACTURING AN IGNITION DEVICE FOR AN INTERNAL COMBUSTION ENGINE, AND IGNITION DEVICE OBTAINED THEREBY

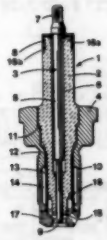
Jean-Francois Tromeur, Pully, Switzerland, assignor to Espada Anstalt, Vaduz, Liechtenstein

Filed May 22, 1981, Ser. No. 266,513

Claims priority, application Switzerland, May 30, 1980, 4212/80

Int. Cl.³ H01T *21/02, 13/32, 13/36*

U.S. Cl. 445—7 **4 Claims**



1. Process for manufacturing a plasma ignition device for internal combustion engines, adapted ignition device for igniting lean mixtures, comprising an insulating ceramic body having a first axial central bore, an axial metal central electrode in said bore, a metal shell comprising a second axial central bore for housing the lower portion of said insulating body and for securely fixing the device to an engine characterized in that the metal central electrode is fixed to the insulating body and has a lower free end and the insulating body is fixed to the metal shell by means of a ceramic-metal brazing technique, in that a metal capsule is made with a general cylindrical shape comprising a central cavity forming a precombustion-chamber and having a plurality of angularly disposed plane faces with an upper circular opening, a lower circular opening, and a central circular opening in each of its plane faces, in that said capsule is subjected to a surface treatment to make it resistant to high temperatures subsequently created by a plasma, in that said capsule is positioned at the lower end of said shell and has previously been treated, and in that said capsule is welded to said base by electrical resistance welding so that the upper circular opening is concentric at the end of the insulating body, and so that the free end of the central electrode is arranged substantially concentrically with respect to the lower circular opening of the capsule, wherein the brazing of the ceramic body and the metal electrode and shell comprises the following steps: metallizing the surface of the ceramic insulator to be brazed by coating said ceramic insulator by means of a powder lay of molyedenum and manganese, lining the treated shell by means of a metal alloy tube resistant to high temperatures, the shell having been previously provided with a recess which allows the tube to deform, and brazing the central electrode to the insulating body and brazing the insulating body to the shell, by means of brazing rings located respectively between the ceramic insulator and the shell, and between the metal electrode and the ceramic insulator, by having these elements stay in an oven with passage under reducing atmosphere at a temperature sufficient to cause the fusion of the brazing ring and the spreading out of the alloy by capillarity along the metal tube, characterized in the further step before welding of precisely positioning said capsule by means of a centering device comprising a tubular piece of a non-weldable material between the capsule and the central electrode, of which the inner diameter corresponds to the outer diameter of the central electrode, and of which the outer diameter corresponds to the diameter of the lower circular opening of the capsule.

4,490,123

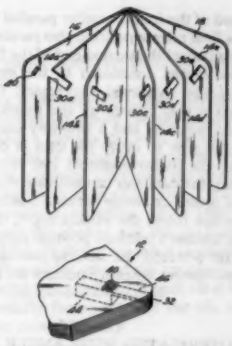
WHISTLE FOR CHILDREN'S BOOK

James F. Becker, 3008 3rd St., Apt. A, and Andrew S. Mayer, 706-1/2 Ashland Ave., both of Santa Monica, Calif. 90405

Filed Nov. 22, 1982, Ser. No. 443,179

Int. Cl.³ A63H *5/00*

U.S. Cl. 446—204 **11 Claims**



1. A whistle, comprising:

plural, overlapping sheets, having respective apertures positioned to overlap to form a resonant cavity;

a slotted sheet, having an air inlet slot extending to the edge of said sheet, said slot positioned to overlap said resonant cavity to provide an air inlet passage into said resonant cavity;

a cover sheet, having an air outlet aperture therein, positioned to overlap said resonant cavity to permit air input through said air inlet passage to exhaust through said air outlet aperture; and

means for maintaining a predetermined relative position among said overlapping sheets.

4,490,124

RUNNING TOY

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed May 9, 1983, Ser. No. 492,999

Claims priority, application Japan, Sep. 30, 1982, 57-148146

Int. Cl.³ A63H *29/00*

U.S. Cl. 446—464 **5 Claims**

1. A self-propelled toy vehicle capable of both a translational and predetermined rotational movement in a play action mode of operation, comprising:

a frame member having a longitudinal axis and a first and second end;

a front wheel assembly attached to the frame member;

a rear wheel assembly attached to the frame member;

a spring-powered motor assembly attached to the frame

member and capable of operatively driving one of the front and rear wheel assemblies for translational movement of the vehicle across a support surface, the wheel assembly driven by the motor assembly also providing an energizing mode of operation to provide a wind-up force for storing energy in the motor assembly, and

means for intentionally propelling the frame member above the support surface and rotating the frame member about an axis traverse to the longitudinal axis while above the support surface during a predetermined period of its translational movement including a pivoting member attached to and extending parallel to the longitudinal axis of the frame member's lower surface, means for biasing the pivoting member to rotate from an initial position adjacent

a first end of the frame member parallel to the longitudinal axis to a final release position also parallel to the longitudinal axis adjacent the second end of the frame member, and a release means connected to the motor assembly for initiating the rotational movement, the release means including a gear driven by the motor assembly, a cam rotatably mounted and a one-way-clutch mechanism to permit the gear to move the cam in one direction only, whereby the motor assembly can store energy without activating the cam and can activate the cam in a running mode of operation, when the cam is activated the pivoting member can rotate the vehicle above the support surface and can assume a released position parallel to the longitudinal axis whereby the vehicle can continue its translational movement when it contacts the support surface.

4,490,125

LUBRICATED WIDE ANGLE JOINT

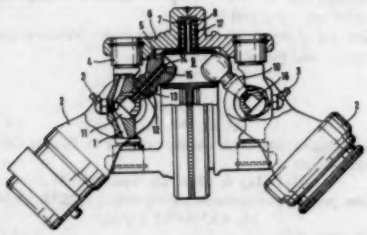
Mathias Konrad, Troisdorf; Paul Herchenbach, Ruppichteroth, and Klaus Kämpf, Lohmar, all of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 421,981

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138190

Int. Cl.³ F16D *3/26, 3/16*

U.S. Cl. 464—11 **3 Claims**



1. In a lubricated wide angle joint including an inner double fork with two outer yokes each connected with said double fork by means of a joint crosspiece, spherical trunnions guiding said outer yoke arranged on the ends of said outer yokes facing the center of the joint, which ends are connected with said yokes by means of a bridge, a guide provided with a centering disc, said centering disc having said spherical trunnions engaged therein, said centering disc being secured against axial displacement but being radially movable, and lubricating nipples provided on each said joint crosspiece and arranged in the middle thereof opening into lubricating channels leading into trunnion bearings, the improvement comprising:

that said joint crosspieces are provided on their inner sides with a partially spherical recess connected with at least one of said lubricating channels;

that said spherical trunnions are provided with a partially spherical shoulder located within said partially sperical recess;

that the midpoints of said partially spherical recess and said partially sperical shoulder lie in the intersecting point of the two axes of the joint crosspiece; and

that said spherical trunnions are provided with an axial through bore hole in flow communication with said spherical recess for effecting lubricant flow therethrough;

said joint being arranged to enable lubricant flow for said centering disc through said nipples and through said partially spherical recesses into said axial through bore holes.

4,490,126

TELESCOPIC HOMOKINETIC JOINT

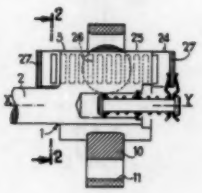
Michel A. Orain, Conflans Sainte Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed May 18, 1982, Ser. No. 379,474

Claims priority, application France, Jun. 1, 1981, 81 10796

Int. Cl.³ F16D *3/24, 3/30*

U.S. Cl. 464—111 **9 Claims**



1. A homokinetic joint comprising:

a first element having a first axis and having three radial wing members equally spaced at substantially 120° from each other about the axis, each radial wing member including two radially extending, uncurved, planar surfaces parallel to each other, said planar surfaces also extending parallel to said first axis to thereby define said planar surfaces;

a second element including three radially extending means for engaging said two planar surfaces of each radial wing, said second element having a second axis and said engaging means extending equally spaced at substantially 120° from each other and in confronting relation with said planar surfaces;

said means for engaging including spherical bearing surfaces disposed on each side of said planar surfaces;

intermediate elements disposed between said spherical bearing surfaces and the wing members, the intermediate element having planar surfaces disposed parallel to and facing the planar surfces of the wing members and having spherical bearing surfaces complementary to and fitting into the spherical bearing surfaces of the engaging means;

rolling elements disposed between the planar surfaces of the wing members and the planar surfaces of the intermediate elements, the rolling elements being arranged in a linear manner and as three sub-assemblies, each subassembly including means for allowing both relative linear and angular displacements of said first and second axis, the allowing means including two linear rows of said rolling elements and a cage in retaining relation to the corresponding two rows of rolling elements; and

return means provided between each said sub-assembly and said first element for elastically returning each sub-assembly to a mean position relative to said first element.

4,490,127

ELECTRICALLY OPERATED TRANSMISSION GEAR SYSTEM FOR BICYCLES

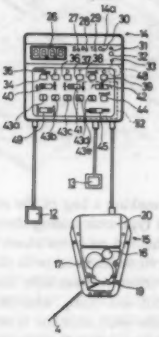
Hirofumi Matsumoto; Masakatu Fujiwara, both of Kasai; Yasuyuki Tsuchida, Kanzaki, and Yoshifumi Miyazaki, Taka, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 21, 1982, Ser. No. 380,894

Claims priority, application Japan, May 29, 1981, 56-83619; Sep. 18, 1981, 56-148457

Int. Cl.³ F16H *7/22*

U.S. Cl. 474—110 **30 Claims**



1. An electrically operated transmission gear system for a bicycle, comprising:

a transmission gear unit including a plurality of transmission gear, an endless chain, and a guide for guiding said endless chain into driving mesh with one of said transmission gears at a time;

an electrically operated gearshifting mechanism including a reversible motor, a takeup reel actuatable by said reversible motor, and a wire joined to said takeup reel and said guide for displacing the latter in response to rotation of said takeup reel to shift said endless chain into driving mesh with one of said transmission gears;

means for measuring the speed at which the bicycle is running and/or the speed of rotation of a crank gear of the bicycle with which said endless chain is in mesh;

means for detecting which transmission gear is in mesh with said endless chain;

an arithmetic unit for deriving a proper range signal from an output from one of said measuring and detecting means and for comparing said proper range signal with an output from the other means to determine whether the transmission gear with which said endless chain is in mesh is proper or not;

a gear position display for displaying an output signal from said arithmetic unit to indicate that the transmission gear held in mesh with said endless chain is too low a transmission gear, too high a transmission gear, or in a proper range;

a gear designation switch;

means for controlling operation of said reversible motor in response to an output signal from said gear designation switch to bring said endless chain into driving mesh with a designated transmission gear;

a source of DC electric power for powering said reversible motor and said arithmetic unit; and

a switch for turning on and off said source of DC electric power; whereby gearshifting for the bicycle can manually be controlled properly.

4,490,128

BEARING-MOUNTED PLASTIC WHEEL

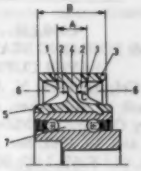
Siegfried Weiss; Günther Heurich, and Werner Kotzab, all of Schweinfurt, Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer & Co., Fed. Rep. of Germany

Filed Jul. 8, 1983, Ser. No. 512,214

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1982, 3226419

Int. Cl.³ F16H *55/36*

U.S. Cl. 474—166 **16 Claims**



1. A rotatable plastic wheel for being mounted on a central bearing, comprising:

an annular ring wheel having a generally H-shaped cross-section, including a radially inward arm, a radially outward arm with a radially outward peripheral travel surface, and a radially extending crossbar between the inward and the outward arms and the crossbar being of narrower axial width than either arm;

a plurality of radially extending wheel stiffening ribs disposed between the inward and the outward arms at the crossbar and the ribs being spaced at circumferential intervals circumferentially around the crossbar;

a respective recess being defined in each rib at both opposite, axially outwardly facing sides of the rib, at least in the region of the outward arm.

4,490,129

FORMING CARTONS

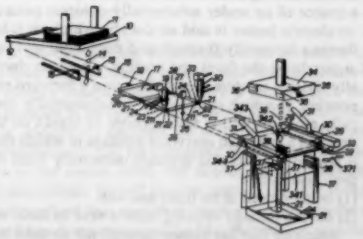
John R. Oakley, Swindon, England, assignor to Metal Box P.L.C., Reading, England

Filed Mar. 1, 1982, Ser. No. 353,242

Claims priority, application United Kingdom, Mar. 2, 1981, 8106509

Int. Cl.³ B31B *1/62, 3/60*

U.S. Cl. 493—8 **5 Claims**



1. A method of forming a carton, in which a carton blank is folded to erect the carton by means of a punch which is forced through the plane of the blank and which cooperates with a die arrangement having pressure members to erect the carton and to press selected parts of the blank against cooperating parts of the blank to seal them together, wherein the blank is of uncoated board and a water-based adhesive is first applied as an

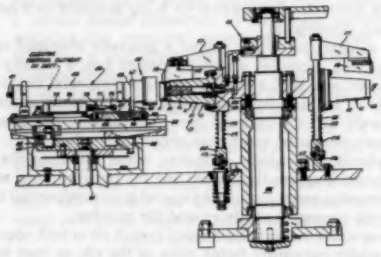
atomized spray to the selected parts of the carton blank by a spray gun or guns under the control of a sensor arranged to detect the arrival of the carton blank at the appropriate position for spraying, the outlet from the or each spray gun being a nozzle controlled by a needle valve which is operated by a solenoid on receipt of a signal from the sensor, and the needle valve and nozzle cooperating to cause a swirling motion of the atomized spray of adhesive, the sprayed adhesive is partially dried by directing hot gas on to the selected parts, and the folding of the carton blank to erect the carton is then effected by the punch and cooperating die arrangement so as to secure the selected and cooperating parts together by means of the partially dried adhesive and thereby to maintain the carton in the erected form.

4,490,130

MACHINE FOR FORMING SEAMS OF TWO-PIECE PAPER CUPS

Daryl R. Konzal, Colgate; Craig N. Johnson, and Donald W. Baumgartner, both of Milwaukee, all of Wis., assignors to Paper Machinery Corporation, Milwaukee, Wis.

Filed Aug. 10, 1981, Ser. No. 291,323
Int. Cl.³ F26B *3/00*; B31C *1/06*
U.S. Cl. 493—106 **15 Claims**



1. In a machine for making cups of thermoplastic coated paper, each comprising a side wall blank and a disc-like bottom wall blank that has its margin formed as a circumferential axially projecting flange portion, said machine comprising a mandrel around which a side wall blank is rolled and which has at an outer end thereof a flat outwardly facing surface against which a bottom wall blank is held with its flange portion projecting outwardly and surrounded by a bottom portion of the rolled side wall blank, heating means for melting coating on said portions of the blanks to provide for their adhesion to one another, said heating means comprising:

A. an air duct with which the mandrel has coaxial alignment and which has a rear end remote from the mandrel, said air duct having near its rear end an inlet connectable with a source of air under substantially constant pressure;

B. an electric heater in said air duct by which air is heated in flowing forwardly through said duct from said inlet;

C. a nozzle on the front end portion of said air duct, coaxially slidable relative thereto between a forward operative position in which said nozzle is substantially concentrically received within said portions of blanks on the mandrel and a retracted rearward position in which the nozzle is spaced a substantial distance outwardly from the mandrel, said nozzle

(1) being closed at its front end and

(2) having radially opening outlets near its front end from which air that has passed through the air duct is emitted for heating said portions of blanks on the mandrel when the nozzle is in its operative position; and

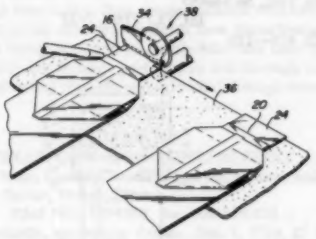
D. cooperating coaxial throttling means in said nozzle and said duct, arranged to define a restricted annular passage through which air flows in passing from the air duct into the nozzle when the nozzle is in its retracted position but to provide for substantially unrestricted flow from the air duct into the nozzle when the nozzle is in its operative position.

4,490,131

METHOD OF MAKING BAGS

Robert L. Coleman, Holland, and Charles F. Schneider, Brookhaven, both of Pa., assignors to Emanuel S. Kardon, Melrose Park, Pa.

Filed Jun. 1, 1982, Ser. No. 383,710
Int. Cl.³ B31B *19/26*
U.S. Cl. 493—217 **1 Claim**



1. A method of making a bag of the automatic or self-opening satchel-bottom type comprising the steps of:

forming a tube having an outer sheet of paper and an inner liner of impervious material with the liner being adhered to the outer sheet substantially throughout the mating surfaces thereof and being nonadhered in a rectangular area on one tube wall near the bottom end of the tube,

said rectangular area extending from a line just inside the edge of the bottom end of the tube, the liner being adhered to the outer sheet along a strip portion between said line and the edge of the bottom end of the tube,

said tube forming step including the step of forming a slit in the liner extending across said rectangular area and parallel to the edge of said bottom end of the tube,

forming a pair of spaced apart parallel slits in said one tube wall extending inwardly from said edge and within said rectangular area to provide a rectangular tab portion,

forming the bottom end of the bag into a diamond fold with the tab portion at one end thereof and a triangular portion at the other end thereof,

sealing the diamond fold along an apex thereof and along an area adjacent said tab portion to completely seal the bottom end of the bag,

folding the diamond fold downwardly into a flat condition,

removing from said tab portion the portion of the liner in said rectangular area between the slit and said edge of said bottom end of said tube,

folding over the triangular portion of said diamond fold opposite said tab portion into a flat condition,

applying adhesive to the inner surface of said outer sheet of paper on an area of said tab portion from which the liner was removed,

and adhering the tab portion to the folded over triangular portion of said diamond fold portion to complete the formation of the bottom of the bag,

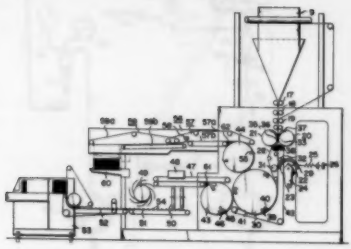
said step of removing the liner from the tab portion including the step of blowing air against said liner portion in the direction toward said bottom end edge to maintain the liner portion in a generally upright position out of contact with the adjacent portion of the outer sheet while being held at said strip portion and severing the outer edge of the bag inside said line to remove the liner portion and strip portion therewith leaving an area of paper outer sheet only.

4,490,132

PAPER FOLDING MACHINES FOR USE IN ROTARY PRESSES

Daisuke Ogura, Yamato, and Shosuke Fujiu, Kawaguchi, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha and Toppan Printing Co. Ltd., both of Tokyo, Japan

Continuation of Ser. No. 262,909, May 12, 1981, abandoned, which is a continuation of Ser. No. 41,490, May 22, 1979, abandoned. This application Sep. 28, 1983, Ser. No. 536,571
Claims priority, application Japan, May 26, 1978, 53-62929
Int. Cl.³ B65H 45/16
U.S. Cl. 493—424 10 Claims



1. A combination machine for selectively transporting paper sheets along one of two alternative paths, one path being a folding path for causing the paper sheets to be folded, and the other path being a delivery path which allows introduced paper sheets to pass therealong without being folded while in said other path, for use in a rotary press, comprising:

a cutting unit which cuts a web of printed paper into a plurality of sheets of printed papers, each sheet having a predetermined length, said cutting unit supplying said sheets separated from each other;

a conveyor unit for clamping and conveying said sheets of printed papers;

a rotatable overlapping drum including a long finger and a short finger for holding a sheet or a plurality of sheets on the overlapping drum, and an insertion spatula mounted on said rotatable overlapping drum for use in producing a fold in the sheets when they pass along the folding path;

cam means operatively coupled to said fingers to cause said fingers to overlap and grip one or a plurality of the sheets of printed papers conveyed to said overlapping drum by said conveyor unit;

a rotatable, selectively operable gripping drum being positioned adjacent said overlapping drum and having a jaw for gripping and folding said sheets of printed papers as the sheets pass along the folding path;

a rotatable, selectively operable sheet delivery drum positioned adjacent said overlapping drum for receiving a plurality of sheets of printed papers from said overlapping drum, said delivery drum including at least one delivery finger for holding the paper sheets to the delivery drum as it rotates; said gripping drum and said delivery drum effecting transport of the paper sheets respectively along the folding path and delivery path without perforating said sheets and without requiring a separate sheet-holding means;

means for causing said overlapping drum to selectively cooperate with said gripping drum and said sheet delivery drum and including means for directing said paper sheets either to said gripping drum in said folding path or to said delivery path for respectively folding a sheet or delivering overlapped sheets;

first holding means (60) for stacking and horizontally holding overlapped sheets;

first transfer means (56) extending in a given direction from adjacent said delivery drum (44) to said first holding means for transferring sheets from said delivery drum to said first holding means;

second transfer means (51,52) located below and spaced vertically apart from said first transfer means (56) and extending from adjacent said gripping drum (43) in a given direction for transferring sheets from said gripping drum in said given direction, said second transfer means having an inlet side adjacent said gripping drum (43) and an outlet side;

second holding means (53) for holding sheets folded in said folding path with the folded sheets extending in a vertical direction, said second holding means being provided on said outlet side of said second transfer means for receiving folded sheets therefrom; and

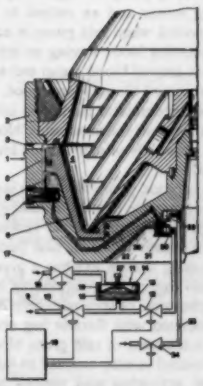
said first and second transfer means extending substantially in the same given direction.

4,490,133

SELF-DISCHARGING CENTRIFUGAL DRUM OUTLET VALVE REGULATING DEVICE

Karl-Heinz Zettler, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Apr. 8, 1982, Ser. No. 366,491
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1981, 3115875
Int. Cl.³ B04B 1/18
U.S. Cl. 494—27 7 Claims

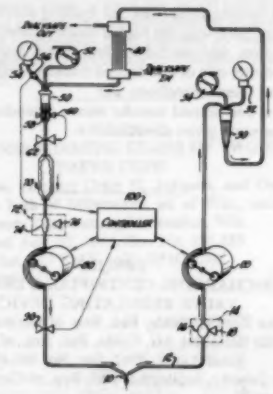


1. In a self-discharging centrifugal drum having a solids space, a fluid actuated outlet valve which diverts closure fluid from a closure compartment to move a piston valve from a closure position to an open position wherein the solids space is partly or completely emptied, an actuating fluid line with a first controllable shutoff for supplying an actuating fluid under pressure to the outlet valve, the improvement comprising: a second controllable shutoff downstream of the first shutoff in the actuating fluid line; metering means positioned in the actuating fluid line downstream of the first shutoff and upstream of the second shutoff for storing a predetermined volume of actuating fluid; means for pressurizing the actuating fluid stored by the metering means; and means for selectively controlling the first and second shutoffs and the pressurizing means to apply a predetermined amount of actuating fluid at a predetermined pressure to the outlet valve each time the solids space is to be emptied.

4,490,134
DUAL PHASE BLOOD FLOW SYSTEM AND METHOD OF OPERATION

Vernon H. Troutner, St. Petersburg, Fla., assignor to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Filed Sep. 24, 1982, Ser. No. 423,378
Int. Cl.³ A61M 5/00
U.S. Cl. 604—5 5 Claims



1. A blood processing system for a patient comprising:

means for withdrawing blood from said patient;

a first arterial blood pump having an input coupled to said withdrawing means and an output at which a flow of blood is provided when said pump is activated;

means for processing blood having an input coupled to the output of said arterial blood pump and an output at which a flow of processed blood is produced;

a flexible blood accumulator having an inlet coupled to said output of said means for processing blood and having an output, said accumulator exhibiting a known blood capacity when full;

a second venous blood pump having an input coupled to the output of said flexible bag accumulator, and an output;

means, coupled to the output of said venous blood pump, for returning processed blood to said patient, wherein said blood processing system exhibits a given blood capacity when full said capacity corresponding to a dialyzer outlet pressure in the range of approximately 20 mmHg pressure;

a monitor associated with flexible bag accumulator for detecting the attainment of said given blood capacity; and

blood pump control means, coupled to said pumps and said monitor, for activating said venous blood pump upon detection of said given blood capacity, and for activating said arterial blood pump after said venous blood pump has been activated for a given number of operating cycles.

4,490,135
SINGLE NEEDLE ALTERNATING BLOOD FLOW SYSTEM

Vernon H. Troutner, St. Petersburg, Fla., assignor to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Filed Sep. 24, 1982, Ser. No. 423,380
Int. Cl.³ A61M 1/03
U.S. Cl. 604—5 12 Claims

1. A hemodialysis system for treatment of a patient comprising:

means for withdrawing blood from said patient;

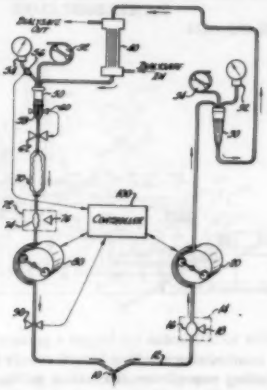
an arterial blood pump having an input coupled to said withdrawing means and an output;

a dialyzer, having an input coupled to the output of said arterial blood pump and an output, for purifying blood flowing therethrough;

a blood accumulator having an input coupled to the output of said dialyzer and an output;

a venous blood pump having an input coupled to the output of said accumulator and an output;

means, coupled to the output of said venous blood pump, for returning purified blood to said patient; and

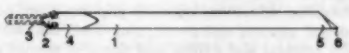


wherein said blood accumulator is flexible and the outside of said flexible accumulator is exposed to atmospheric pressure so as to reference blood pressure within said accumulator to atmospheric pressure whereby substantially no back pressure is generated during operation of said arterial pump until the accumulator reaches its expansive limits.

4,490,136
TROCAR

Fred V. G. Ekbladh, Särö, and Hans Tillander, Göteborg, both of Sweden, assignors to Aktiebolaget Meteve, Goteborg, Sweden

Filed Sep. 28, 1982, Ser. No. 425,953
Claims priority, application Sweden, Oct. 14, 1981, 8106075
Int. Cl.³ A61B 17/34
U.S. Cl. 604—22 6 Claims



1. An improved trocar for making a fissure-shaped incision in skin and bringing a tube through said skin and adjacent tissue with reduced risk of slippage in or cuts to the hands of a surgeon using said trocar, comprising:

a flattened oblong unit having a front end provided with a front edge arranged at an angle to the longitudinal axis of the unit to form an oblique point, a rear end provided with means for attaching a tube thereto, and two substantially flat opposed elongate surfaces intermediate said ends to be grasped by said surgeon,

said unit having a width equal to about one-half of the circumference of said tube, and

said front edge provided with at least one facet that extends from said point rearwardly along said edge to form a sharpened cutting edge and enables said cutting edge to split said skin in the fissure direction,

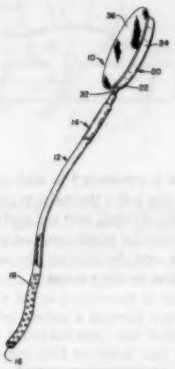
whereby use of said edge produces a fissure-shaped incision, and whereby the flattened shape of said unit enables the trocar to be used with reduced risk of slippage.

4,490,137

SURGICALLY IMPLANTABLE PERITONEAL DIALYSIS APPARATUS

Nabil W. Moukheibir, 2636 Suffolk St., Kingsport, Tenn. 37660

Filed Sep. 30, 1982, Ser. No. 428,831
Int. Cl.³ A61M 5/00
U.S. Cl. 604—28 9 Claims



1. Surgically implantable apparatus adapted for subcutaneous placement in the body of a patient and by which peritoneal dialysis may be performed, said apparatus comprising:

reservoir means defining a first wall, and a peripheral wall formed at the periphery of the first wall at about right angles thereto and extending a predetermined distance therefrom and defining at its free end of opening opposite the first wall, said reservoir means being formed from a needle-impenetrable material;

needle-penetrable covering means extending across the opening of said reservoir means and suitably secured to said peripheral wall and being sufficiently permeable to allow body tissue ingrowth to occur and to seal the surface of said covering means when the apparatus is implanted in a patient;

an essentially nonyielding support means for said needle-penetrable covering means extending across said opening beneath and contiguous with the undersurface of said covering means and suitably fixed to said peripheral wall and spaced at predetermined intervals across the undersurface of said covering means, said essentially nonyielding support means comprising a series of spaced bars formed in a predetermined pattern; and

means defining a nozzle extending from said reservoir means and having an opening extending therethrough and into the interior of said reservoir means, said nozzle being adapted to receive thereover one end of a catheter that will extend into the peritoneal cavity of the patient.

4,490,138

PHARYNGEAL SUCTION DEVICE

Steven Lipsky, 7720 Foothills Dr. S., Paradise Valley, Ariz. 85253, and John D. Dale, 1211 W. Rovey, Phoenix, Ariz. 85013

Filed Sep. 13, 1982, Ser. No. 417,044
Int. Cl.³ A61M 7/00
U.S. Cl. 604—40 4 Claims

1. A suction device comprising:

a hollow tube having an open influent end and an open effluent end for communicating with a vacuum and collection system,

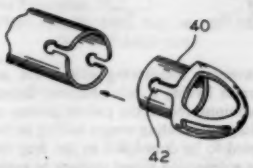
said tube being provided with recesses in the tube extending from the influent end of the tube toward the effluent end to prevent a full vacuum from being formed within the tube and to permit continued suction when the influent end of the suction device is blocked.

a tip guard for attachment to said influent end of said tube,

said tip guard comprising a hollow sleeve having a collar at one end,

the other end of said sleeve being slidably movable within the influent end of said tube with the collar being positioned adjacent the end of the tube,

said sleeve being provided with a pair of longitudinally extending boss means spacedly positioned to extend outwardly from the surface of said sleeve for longitudinally



slidably moving into the recesses of the end of the tube when the sleeve is moved into the tube until said collar engages the end of the tube, and

three elongated arcuate members each having one end attached to said collar with each of the other ends of the arcuate members joined together at the major axis to outline a substantially hemispherical surface over the influent end of the tube,

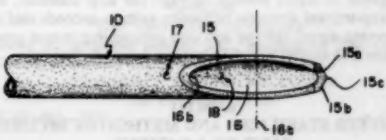
said members defining three passageways therebetween through which material may pass into the influent end of the tube.

4,490,139

IMPLANT NEEDLE AND METHOD

John R. Huizenga, Mooresville, and Lloyd E. Reddix, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 28, 1983, Ser. No. 461,912
Int. Cl.³ A61M 5/00
U.S. Cl. 604—57 14 Claims



1. A subcutaneous implant needle for flexible implant pellets comprising a hollow metal tube having an outer diameter of a significant fraction of an inch and of sufficient rigidity to resist bending when subjected to manual force,

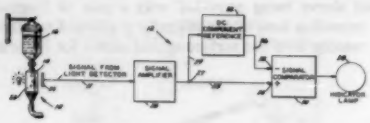
one end of the tube being cut on a plane at an angle less than 30° with respect to the central axis of the tube to define an end face surrounding an elliptical opening and having an elliptical outer edge, said end being provided with a pair of dimples, one located a fraction of an inch forward of the rear edge of the opening and the other located a fraction of an inch behind the opening.

4,490,140

INTRAVENOUS MONITORING SYSTEM UTILIZING A DYNAMIC REFERENCE THRESHOLD

Travis C. Carr, Mundelein, and Dale E. Finch, McHenry, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jul. 30, 1982, Ser. No. 403,382
Int. Cl.³ A61M 5/16
U.S. Cl. 604—65 **15 Claims**



1. An intravenous monitoring system for an intravenous feeding apparatus having a drip chamber through which the liquid to be administered to the patient passes, comprising:

a signal voltage generating means having an output terminal and adapted to be connected to the drip chamber which generates a detecting signal voltage in response to liquid passing through said drip chamber;

a comparator means having a first input connection coupled to said output terminal of said signal voltage generating means, a second input connection and a output connection which generates an output signal voltage when a signal voltage at one of the input connections exceeds the signal voltage at the other input connection;

a D.C. component reference circuit that generates a proportional dynamic reference threshold voltage, said D.C. component reference circuit comprises a signal voltage reduction means that is coupled between said second input connection of said comparator means and said output terminal of said signal voltage generating means, said signal voltage reduction means reduces said detecting signal voltage forming a reduced output signal voltage that is less than said proportional dynamic reference threshold voltage, said signal voltage reduction means comprises a first diode and a resistor that are coupled in parallel, and an RC circuit coupled between said signal voltage reduction means and said second input connecton and said second input connection of said comparator means, the resistor of said RC circuit forms a voltage divider with said resistor of said signal voltage reduction means thereby creating said proportional dynamic reference threshold voltage that varies the sensitivity of intravenous monitoring systems in response to changes in said detecting signal voltage, said RC circuit stores and emits a residual signal voltage, that is less than said dynamic reference threshold voltage, to said comparator means whenever said detecting signal voltage changes in response to liquid passing through the drip chamber, said proportional dynamic reference voltage exceeds said detecting signal voltage and said comparator means generates said output signal voltage in response thereto.

4,490,141

CATHETER STABILIZER AND METHOD OF SECURING SAME TO A PATIENT

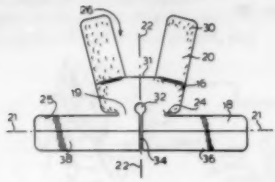
Mark A. Lacko, Brooklyn; Malcolm J. Brooks; Douglas M. Spranger, both of New York, all of N.Y., and Peter P. Mitchell, Hoboken, N.J., assignors to Becton Dickinson and Company, Paramus, N.J.

Filed Aug. 4, 1982, Ser. No. 404,991
Int. Cl.³ A61M 25/02
U.S. Cl. 604—180 **15 Claims**

1. A stabilizer device for securing a catheter or like instrument to a patient comprising:

an anchoring portion having an adhesive on a lower surface thereof for securing the same to the skin of a patient; and

a stabilizing portion hingedly connected to said anchoring portion adapted to fold over said anchoring portion, said stabilizing portion having an adhesive on an upper surface for securing the stabilizing portion to the upper surface of said anchoring portion when folded thereover, said stabilizing portion having a hole therethrough adjacent said hinged connection for surrounding a catheter or like instrument which is connected to said patient, said anchoring portion having a slot thereacross communicating with said hole thereby dividing said anchoring portion into two separable segments for positioning around said catheter or like instrument and facilitating the securement of said anchoring portion to the patient.

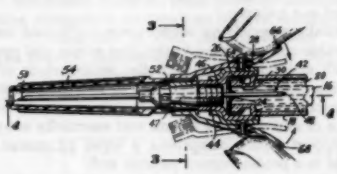


4,490,142

CARPULE SYRINGE WITH RAPIDLY ACTING MECHANISM FOR CONTROLLABLY POSITIVELY RETAINING THE HUB OF A HYPODERMIC NEEDLE

Rubin D. Silvern, 12 Sulgrave Rd., Scarsdale, N.Y. 10583

Continuation-in-part of Ser. No. 360,605, May 21, 1982, abandoned. This application Aug. 22, 1983, Ser. No. 525,119
Int. Cl.³ A61M 5/00
U.S. Cl. 604—241 **6 Claims**



1. A carpule syringe having a frame with a forward end provided with a female threaded bore, a tubular plug with a male thread screwed into the female threaded bore of the syringe frame, said plug having a forwardly tapered tubular extension designed to receive and frictionally engage the tapered socket of a double-ended hypodermic needle, said needle including a hub with a tapered socket dimensioned to matingly frictionally engage the tapered extension of the plug, said hub supporting a rearwardly extending sharpened point adapted to pierce a diaphragm of a carpule received in the syringe frame and a forwardly extending sharpened point designed to be used for injection of a carpule-contained medicament into a patient, and means to prevent accidental detachment of the needle hub from the tapered extension, said means constituting a pair of clamping arms having jaws, means to pivotally mount said clamping arms at diametrically opposed positions on the carpule frame, said clamping arms being manually manipulatable to urge their jaws apart and spring means to bias the jaws together against opposite sides of the hub.

4,490,143

FEEDING TUBE ASSEMBLY

David G. Quinn, Grayslake, and Robert B. Edwards, II, Libertyville, both of Ill., assignors to Viridian, Inc., Wheeling, Ill.

Filed Sep. 24, 1982, Ser. No. 422,565
Int. Cl.³ A61J 7/00
U.S. Cl. 604—270 9 Claims

1. A feeding assembly having a flexible tube of predetermined diameter for selective enteric administration and aspiration of fluids to and from the gastrointestinal tract of a patient, the tube having a proximal end joined to an enteric feeding bag, and a distal end, comprising in combination:

a non-collapsible bolus positioned at the distal end of said tube, said bolus having a tapered frustoconical distal end and a tapered proximal end, said bolus having its largest diameter between said proximal and distal portions, said bolus having a diameter greater than the diameter of said tube, said bolus also having a first internal channel in fluid communication with said tube, said bolus possessing at least one outside opening in fluid communication with said first channel whereby said tube and said bolus can selectively accommodate fluids introduced thereto from said bag to exit said bolus for enteric feeding and through said tube and said bolus to facilitate aspiration of fluids from the gastrointestinal tract of a patient; and

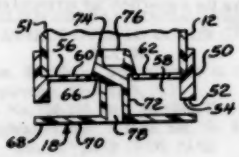
an elongated weighted guide tip located distal to said bolus, said guide tip having a diameter less than the diameter of said bolus.

4,490,144

URINE DRAINAGE RECEPTACLE WITH A NORMALLY OPEN REFLUX VALVE

Carl J. Steigerwald, Wauconda, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Feb. 10, 1983, Ser. No. 465,384
Int. Cl.³ A61F 5/44
U.S. Cl. 604—323 12 Claims



1. A urine drainage system, comprising:

a receptacle having a chamber to receive liquid, a depending annular wall defining a valve seat at a lower portion thereof and an opening in the region of the seat, and a retainer assembly extending across said opening and having an aperture extending therethrough in said opening; and means to suspend the device in a vertical upright position and;

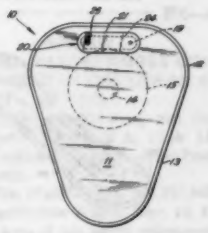
a valve element means of elastic material comprising a disc member means being sufficiently large to extend across said opening and sealingly engage against said seat peripherally around the wall, and a stem extending from said disc member means and being slidably received in said aperture, said stem having a boss spaced from said disc member means with dimensions larger than said aperture such that the boss maintains the stem in the aperture, said stem having a sufficient length between the boss and disc such that the disc member means is spaced from the seat when the boss engages against the retainer assembly, said disc member means depending from the stem when the valve element means is in a normally open position when the receptacle is vertically suspended in an upright position.

4,490,145

OSTOMY POUCH WITH DEODORIZING FILTER

Randolph E. Campbell, Red Bank, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 27, 1983, Ser. No. 507,880
Int. Cl.³ A61F 5/44
U.S. Cl. 604—333 16 Claims



1. An ostomy pouch comprising two pouch walls of moisture proof, odor proof polymeric materials sealed together along at least a substantial portion of their peripheral edge to form said pouch, one of said pouch walls having an aperture adapted in use to fit around the stoma of the user, said stomal aperture encircled by means for attaching said pouch to the body of the user, the second pouch wall having an aperture in its upper region above the stomal opening in the first pouch wall so that fecal matter discharged from the stoma into the pouch will not readily contact said second pouch wall aperture, a filter element comprising a polymeric film cover having an aperture and an insert of gas deodorizing material, and said film cover affixed to said second pouch wall so that opposite ends of said insert of gas deodorizing material overlie said second pouch wall and said film cover apertures whereby gas within the pouch travels into said filter element and through said gas deodorizing material before being vented to the atmosphere.

4,490,146

LAPAROTOMY SPONGES

Timothy L. Sergeant, Seneca, S.C., assignor to The Kendall Company, Boston, Mass.

Filed Mar. 1, 1983, Ser. No. 471,363
Int. Cl.³ A61F 13/00
U.S. Cl. 604—358 5 Claims

1. An abdominal pack of generally rectangular configuration and with atraumatic ravel-resistant edges which comprises

a multiplicity of interdependent plies of open-mesh gauzelike absorbent fabric sealed along all four edges,

individual sets of said plies being united transversely of the width of said pack by at least one transverse yarnl common to a multiplicity of said plies,

said pack being sealed along its four edges by a sealing process,

one sealed edge being disposed on the exterior of said pack, said other three sealed edges being disposed in the interior of said pack.

4,490,147

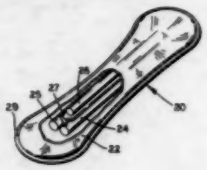
ABSORBENT SANITARY NAPKIN

Larry L. Pierce, and June S. Pierce, both of 4120 Vansant Rd., Douglasville, Ga. 30135

Continuation-in-part of Ser. No. 213,233, Dec. 5, 1980, Pat. No. 4,340,058. This application Jul. 19, 1982, Ser. No. 399,303

Int. Cl.³ A61F *13/16*

U.S. Cl. 604—378 **16 Claims**



1. A sanitary napkin comprising a plurality of elongate absorbent pads arranged parallel to one another and in a bundle generally triangular in cross-section with a first layer of pads arranged in side-by-side relationship, a pad overlying the pads of the first layer of pads at a position over the adjacent surfaces of the pads in the first layer and forming a second layer of pad material, an elongated swellable sponge positioned between said first layer of pads and said second layer of pad material, a liquid-pervious material surrounding all of said pads for holding the pads in an uncompressed bundled relationship with the pads movable longitudinally with respect to one another, a sheet of liquid-impervious material substantially covering the bottom portion of the first layer of pads, and a layer of adhesive material disposed on the bottom portion of said napkin for securing said napkin to an undergarment, as a result of the napkin not being compressed said napkin being characterized by being bendable along its length with portions of some of the pads movable longitudinally with respect to others of the pads as the napkin is bent along its length whereby the napkin is placed in external contact with the female human body with the second layer of pad material in aligned contact with the labia and with the first layer of pads holding the second layer of pad material in contact with the labia and bending the napkin along its length as necessary to conform to the curvature of the external surfaces of the anatomy adjacent the labia.

4,490,148

PROTECTOR AGAINST INCONTINENCE OR DIAPER

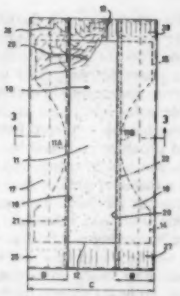
Bo Beckeström, Vällingby, Sweden, assignor to Landstingens Inkopscentral, LIC, ekonomisk forening, Solna, Sweden

Filed Nov. 12, 1982, Ser. No. 440,947

Claims priority, application Sweden, Jul. 1, 1982, 8204083

Int. Cl.³ A41B *13/02*

U.S. Cl. 604—385 **9 Claims**



1. Protector against incontinence or diaper which when extended has an essentially rectangular shape and which comprises a bottom, liquid-tight layer such as a plastic sheet, which carries an oblong absorbent body fixed to the bottom layer, the bottom layer being provided with longitudinal elastic lines such as elastic threads, bands or lines of elastic coating arranged along at least a portion of the length of the protector to gather together the protector in the free state by elastic contraction of the elastic portions and to effect elastic and sealing contact with adjacent bodily parts in the position for use, characterized in that the bottom layer is extended to the sides with side flaps which are folded in over the bottom layer, that said side flaps are fastened at their end portions to the bottom layer, and that the elastic lines are arranged at the free edges of the side flaps.

4,490,149

MODIFICATION OF POLYESTER PRODUCTS

Kouichi Saitou, Kusatsu; Shunroku Tohyama, Shiga, and Yoshikazu Kosaka, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Sep. 9, 1983, Ser. No. 530,652
Claims priority, application Japan, Dec. 29, 1982, 57-231990
Int. Cl.³ C08F 1/13; D06P 3/00
U.S. Cl. 8—539 5 Claims

1. A process for producing modified polyester products, comprising dyeing a polyester product obtained by the graft polymerization of a polyester with vinyl monomers having an acidic group and replacing said acidic hydrogen atom with an alkali metal salt, wherein said replacing is carried out after said dyeing.

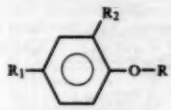
4,490,150

USE OF POLYOXYALKYLATED ALKYL PHENOLS AS DYEING ASSISTANTS FOR DISPERSE DYES

Juerg Heller, Bottmingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Feb. 3, 1983, Ser. No. 463,461
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1982, 3203650
Int. Cl.³ D06P 1/61, 3/42
U.S. Cl. 8—610 22 Claims

1. In a process wherein a textile substrate is dyed or printed with an aqueous dyebath, aqueous padding liquor or aqueous printing paste containing a disperse dyestuff or wherein a textile substrate dyed or printed with a disperse dye is lightened or stripped in an aqueous liquor, the improvement which comprises having present in the aqueous medium, in an amount sufficient to shift the equilibrium of the disperse dyestuff between the aqueous medium and the substrate in favor of the aqueous medium, a compound of formula I



I

wherein one of R_1 and R_2, is hydrogen or C_{4-12}alkyl, and the other is C_{4-12}alkyl, and R is an ordered chain of a block of 7 to 18 ethyleneoxy units followed by a block of 3 to 16 propyleneoxy units beginning from the phenoxy moiety.

4,490,151

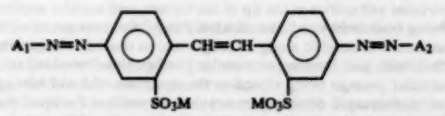
DISAZO SULFOPHENYLPYRAZOLONESTILBENE DYES AND DIRECT DYES TO COLOR CELLULOSE BLACK

David A. Brode, Birdsboro, Pa., assignor to Crompton and Knowles Corporation, New York, N.Y.

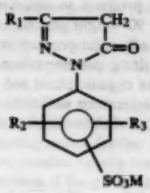
Division of Ser. No. 334,232, Dec. 24, 1981, Pat. No. 4,455,258. This application Nov. 7, 1983, Ser. No. 549,404
Int. Cl.³ C09B 29/00, 33/02
U.S. Cl. 8—639 18 Claims

1. An aqueous dye solution containing the following:

(a) a compound having the structure:



wherein A_1 and A_2 can be the same or different and represent the residue of a phenylpyrazolone compound having the following structure:



wherein:

R_1 is —CH_3, —COOH and —COO-lower alkyl;

R_2 and R_3 independently of one another represent —H, -lower alkyl, -lower alkoxy and -halogen; and

M represents the same or different water solubilizing cations; and

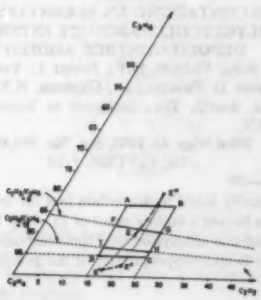
(b) a water soluble direct blue dye.

4,490,152

TERNARY FUEL HAVING FAIRLY CONSTANT ACETYLENE CONTENT IN THE LIQUID AND VAPOR PHASE

Maurice Bruni, Tremblay-les-Gonesse, and George Dubox, Paris, both of France, assignors to L'Air Liquide-Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Feb. 25, 1982, Ser. No. 352,345
Claims priority, application France, Mar. 16, 1981, 81 05207
The portion of the term of this patent subsequent to Jan. 17, 2001, has been disclaimed.
Int. Cl.³ C10L 1/00
U.S. Cl. 44—50 5 Claims



1. Ternary fuel mixtures having a fairly constant acetylene content in the liquid and vapor phases, consisting of a mixture of acetylene, ethylene and a hydrocarbon containing three carbon atoms in its molecule, wherein said mixture contains 15 to 25% by volume of acetylene, 5 to 17% by volume of the C_3 hydrocarbon and the remainder ethylene.

4,490,153

PROCESS FOR THE PRODUCTION OF GASOHOL

Morgan C. Y. Sze, Portsmouth, N.H., and George D. Sucia, Ridgewood, N.J., assignors to Lummus Crest Inc., Bloomfield, N.J.

Continuation of Ser. No. 304,476, Sep. 22, 1981, abandoned. This application Oct. 31, 1983, Ser. No. 546,871
Int. Cl.³ C10L 1/02
U.S. Cl. 44—56 11 Claims

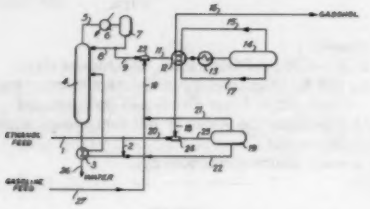
1. A process for the production of a gasoline-ethanol fuel for internal combustion engines, comprising the steps of:

(a) dehydrating a dilute aqueous ethanol solution to an ex-

tent sufficient to produce an aqueous ethanolic product containing about 90 weight percent ethanol;

(b) contacting said ethanolic product with a gasoline;

(c) cooling the resulting gasoline-ethanolic product admixture comprising an organic phase and an aqueous phase to a subambient temperature sufficient to expel from said organic phase most of the water it contains without forming ice;



(d) separating the resultant organic phase comprising a major amount of gasoline and ethanol from the resultant aqueous phase comprising a minor amount of gasoline; and

(e) recovering the resultant gasoline-ethanol product suitable for use as said fuel.

4,490,154

FUELS CONTAINING AN ALKENYLSUCCINYL POLYGLYCOLCARBONATE ESTER AS A DEPOSIT-CONTROL ADDITIVE

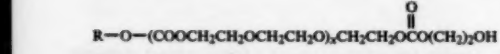
Rodney L. Sung, Fishkill, N.Y.; Ernest L. Yeakey, Houston, Tex.; Walter D. Foucher, Jr., Glenham, N.Y., and Michael Cuscurida, Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 20, 1983, Ser. No. 496,698

Int. Cl.³ C10L 1/18

U.S. Cl. 44—70 **7 Claims**

1. A normally liquid hydrocarbon fuel for internal combustion engines having a boiling point of 75°–700° F. and containing of at least one alkenylsuccinyl (polycarbonatepolyglycolethyleneoxy)-B-hydroxypropionate of the general formula:



wherein R is alkenylsuccinyl in which the alkenyl radical has a molecular weight in the range of about 250 to 3000 and x is an integer ranging from 2 to 10.

4,490,155

MANNICH REACTION PRODUCTS OF DIAMINOPROPANES WITH FORMALDEHYDE AND SALICYCLIC ACIDS

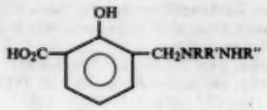
Benjamin J. Kaufman, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Aug. 17, 1983, Ser. No. 524,004

Int. Cl.³ C10L 1/22

U.S. Cl. 44—71 **20 Claims**

1. A composition of matter comprising one or more compounds of the formula:



wherein R and R'' are the same or different and include hydrogen, alkyl, aryl, alkenyl, alkaryl, and cycloalkyl groups having from about 8 to about 20 carbon atoms; and R' is a divalent hydrocarbyl radical of the group of alkylene having about 1 to about 5 carbon atoms, arylene, alkarylene, and arylenealkylene having about 6 to about 30 carbon atoms.

4,490,156

PARTIAL OXIDATION SYSTEM

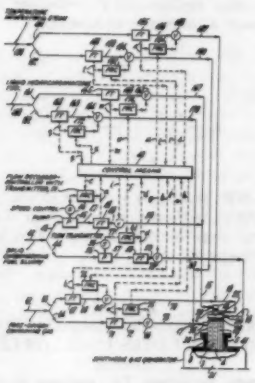
Charles P. Marion, Mamaroneck; William B. Crouch, Chappaqua; Albert Brent, Huntington, all of N.Y.; George N. Richter, San Marino, Calif.; Edward T. Child, Tarrytown, N.Y., and Blake Reynolds, Riverside, Conn., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 272,420, Jun. 10, 1981, Pat. No. 4,394,137, which is a continuation-in-part of Ser. No. 212,054, Dec. 3, 1980, Pat. No. 4,371,378, which is a continuation-in-part of Ser. No. 167,876, Jul. 14, 1980, Pat. No. 4,351,645, which is a continuation-in-part of Ser. No. 107,215, Dec. 26, 1979, Pat. No. 4,338,099. This application Sep. 24, 1982, Ser. No. 422,938

The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.

Int. Cl.³ C10J 3/50

U.S. Cl. 48—61 **2 Claims**



1. A system for controlling the introduction of a plurality of reactant streams into the reaction zone of a partial oxidation gas generator comprising: a two-section burner having a central section with separate first and second fluid passage means and an annular section with separate third and fourth fluid passage means, and wherein the central section of the burner includes a central conduit, said central conduit being closed at the upstream end and having an unobstructed downstream circular exit orifice at the tip of the burner; said annular section being bounded by an outer conduit coaxial and concentric with said central conduit along its length and in spaced relationship therewith and forming an annular passage therebetween, said annular passage being closed at the upstream end and having an unobstructed downstream annular exit orific at the tip of the burner and wherein the central longitudinal axis of the annular passage is parallel to the central longitudinal axis of the burner throughout its length; said first passage means comprises a central bunch of tubes passing through the closed end of said central conduit and making a gastight seal therewith, and

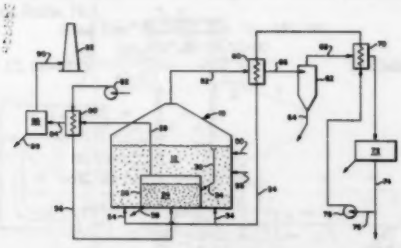
wherein the downstream ends of said central bunch of tubes are retracted upstream from the burner face a distance of about 0 to 12 times the minimum diameter of the central conduit exit orifice at the tip of the burner; said second passage means comprising the space between the inside wall of said central conduit and the outside surfaces of the central bunch of tubes; said third passage means comprising an annular bunch of tubes passing through the closed end of said annular passage and making a gastight seal therewith, and wherein the downstream ends of said annular bunch of tubes are retracted upstream from the burner face a distance of about 0 to 12 times the minimum width of the annular exit orifice at the tip of the burner; and said fourth passage means comprising the space between the inside wall of the outer conduit and the outside surfaces of the annular bunch of tubes; said burner having two separate burner inlet lines connected to each section so that each fluid passage means in each section of the burner is connected to a separate burner inlet line by separate upstream inlet means; conduit means including four pairs of branch feed lines connecting four reactant streams to said four burner inlet lines for introducing separate portions of two or more of said reactant streams into one or both sections of the burner, said burner discharging said reactant streams or mixtures thereof into said reaction zone; a separate flow rate sensing means and a separate flow rate controller in each of said eight branch feed lines for independently sensing the flow rate for that portion of a reactant stream flowing through that particular branch feed line and providing a signal corresponding to the actual flow rate; and a control means operatively connected to each flow rate sensing means and to each flow rate controller receiving said signal from said flow rate sensing means and comparing said flow rate signal with a manual or automatically computed and inserted input signal representing the desired flow rate or set point at that moment for that portion of the reactant stream, and providing a corresponding adjustment signal for separately operating the flow rate controller in that particular branch feed line and thereby independently controlling the flow rate of that portion of said reactant stream entering the burner at that moment.

4,490,157

INDIRECTLY HEATED FLUIDIZED BED GASIFIER

John H. Fernandes, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 10, 1983, Ser. No. 456,653
Int. Cl.³ C10J 3/56; B01J 8/26
U.S. Cl. 48—62 R **12 Claims**



1. An apparatus for gasifying a first carbonaceous fuel, comprising:

a fluidized bed gasification reactor for fluidizing said first fuel in a fluidizing gas stream;

a fluidized bed combustor, at least partially disposed within the gasification reactor, for combusting a second fuel and having thermally conductive walls for indirectly transferring heat energy from the combustor fluidized bed to the gasification reactor fluidized bed for causing the production of a fuel gas from the fluidized first fuel;

means for conducting the gaseous products of combustion away from the combustor;

means for conducting the product fuel gas away from the gasification reactor separate from the gaseous products of combustion;

means, disposed within the gasification reactor, for removing a portion of the fluidized first fuel from the gasification reactor, the removing means further comprising a substantially vertical first conduit openly terminating at the upper end below the surface of the gasification fluidized bed; and

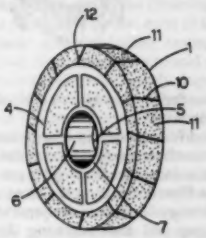
means for introducing the removed first fuel into the combustor as the second fuel, the introducing means further comprising a second conduit between the lower end of the first conduit and the fluidized bed combustor, whereby a portion of the fluidized first fuel in the gasification reactor enters the upper end of the first conduit, falls to the lower end thereof, and is conveyed into the combustor via the second conduit.

4,490,158

GRINDING WHEEL FOR ELECTROLYTIC AND MECHANICAL GRINDING

Akio Kuromatsu, Yokohama, Japan, assignor to Okyo Jiki Lab. Co., Tokyo and Nicco Machine Tool Company, Ltd., Kanagawa, both of, Japan

Division of Ser. No. 373,720, Apr. 30, 1982,. This application Jul. 15, 1983, Ser. No. 513,960
Claims priority, application Japan, May 21, 1981, 56-75690
Int. Cl.³ B24D 3/00
U.S. Cl. 51—293 **17 Claims**



1. A method of manufacturing a grinding wheel comprising:

forming an annular grindstone of abrasive particles, said grindstone having opposed sides, a circumferential rim, and a center aperture,

fitting an annular electroconductive tube into said aperture, and

making a plurality of alternating electrically conductive zones and non-conductive grinding zones around the rim, said conductive zones being electrically connected to said tube.

4,490,159

SYSTEM AND METHOD FOR CONTROLLING ENERGIZATION OF ELECTRODES IN ELECTROSTATIC DUST SEPARATORS

Sigvard Matts, Växjö, Sweden, assignor to Flakt Aktiebolag, Nacka, Sweden

Filed Mar. 17, 1983, Ser. No. 476,217
Claims priority, application Sweden, Mar. 25, 1982, 8201907
Int. Cl.³ B03C 3/68
U.S. Cl. 55—2 **9 Claims**

1. A system for controlling energy input to each of a number of electrostatic dust separator devices having a gas inlet for receiving a dust-laden gas flow and a gas outlet for exhausting a cleaned gas flow comprising:

detector means adapted to be disposed in the gas outlet for

detecting the dust concentration in the exhausted cleaned gas;

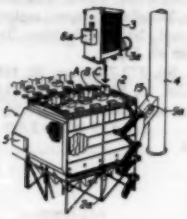
control means adapted to be coupled with said separator devices for controlling the energy input to each separator device;

actuator means coupled with the control means for actuating the control means to first change and then restore the energy input to the separator devices in a selected sequence thereby causing a change and restoration of the dust concentration in the exhausted cleaned gas;

computation means coupled with the detector means for computing each change in said dust concentration resulting from said change in energy input to the respective separator devices in the sequence;

calculator means coupled with the computation means for selecting which one of the number of separator devices produces a desired change in dust concentration in response to the change in energy input to the one separator device; and

an actuating device coupled with the calculator means and the control means adapted to actuate the control means to change the energy input to the at least one selected separator device for producing said desired change in dust concentration level.



6. A method for controlling energy input to each of a number of electrostatic dust separator devices having a gas inlet for receiving a dust-laden gas flow and a gas outlet for exhausting a cleaned gas flow comprising the steps of:

inputting energy to each of the separator devices;

first changing and then restoring the energy input by a certain amount to each of the separator devices in a selected sequence;

detecting the resulting change in dust concentration in the exhausted gas flow;

storing each change in dust concentration resulting from the change in energy input to each of the respective separator devices;

selecting at least one separator device which produces a desired change in dust concentration in response to the change in energy input to each of the respective separator devices; and

changing the energy input to said at least one selected separator device so as to produce the desired change in dust concentration.

4,490,160

METHOD FOR ENRICHMENT OF NITROGEN IN AIR BY THE METHOD OF ADSORPTION AND A CARBONACEOUS ADSORBENT SUITABLE THEREFOR

Nakaji Yuki, and Hiroshi Kitagawa, both of Ibaraki, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 354,242, Mar. 3, 1982, abandoned. This application Sep. 6, 1983, Ser. No. 529,740

Claims priority, application Japan, Apr. 23, 1981, 56-61612

Int. Cl.³ B01D *53/02, 53/04;* **C01B** *31/02, 31/08*

U.S. Cl. 55—68 **3 Claims**

1. In a method for the enrichment of nitrogen in air by the selective adsorption of oxygen on a carbonaceous adsorbent material, the improvement that the carbonaceous adsorbent material is prepared by the procedure comprising the steps of:

(a) charring a non-coking coal at a temperature in the range from 600° to 700° C. for 1 to 2 hours in an atmosphere lean in oxygen to give a coal char;

(b) pulverizing the coal char;

(c) blending the pulverized coal char with a sulfite pulp waste liquor in an amount in the range from 10 to 20% by weight as solid based on the pulverized coal char;

(d) shaping the blend of the pulverized coal char and the sulfite pulp waste liquor into pellets or granules; and

(e) carbonizing the pellets or granules by heating in a non-oxzidizing atmosphere at a temperature in the range from 300° to 420° C. for 1 to 2 hours.

2. The improvement as claimed in claim 1 wherein the pulverized coal char has a particle size distribution to pass a screen of 100 mesh openings by the Tyler standard.

3. A method for the enrichment of nitrogen in air by the selective adsorption of oxygen on a carbonaceous adsorbent material comprising

preparing a carbonaceous adsorbent material by the steps of

(a) charring a non-coking coal at a temperature in the range from 600° to 700° C. for 1 to 2 hours in an atmosphere lean in oxygen to give a coal char;

(b) pulverizing the coal char;

(c) blending the pulverized coal char with a sulfite pulp waste liquor in an amount in the range from 10 to 20% by weight as solid based on the pulverized coal char;

(d) shaping the blend of the pulverized coal char and the sulfite pulp waste liquor into pellets or granules; and

(e) carbonizing the pellets or granules by heating in a non-oxidizing atmosphere at a temperature in the range from 300° to 420° C. for 1 to 2 hours; and passing air to be nitrogen enriched through the resulting pellets or granules.

4,490,161

PILLARED STRUCTURE OF GAS-TREATING APPARATUS

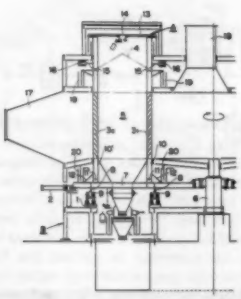
Yoshifumi Ito; Kenichi Yanagi; Naoharu Shinoda, and Seiji Higaki, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 265,357, May 20, 1981, abandoned. This application Dec. 10, 1982, Ser. No. 448,740

Claims priority, application Japan, May 23, 1980, 55-67723

Int. Cl.³ B01D *53/06*

U.S. Cl. 55—181 **4 Claims**



1. Gas-treatment apparatus comprising a rotary cage structure mounted for rotation about a vertical axis and including a plurality of adsorbent chambers arranged adjacent each other in a generally circular array, said adsorbent chambers being packed with an adsorbent material, gas flow means arranged on the periphery of said rotary cage structure for introducing gas into said adsorbent chambers at one angular location and for exhausting gas therefrom at another angular location, and

drive means rotating said rotary cage structure about said vertical axis to move said adsorbent chambers in a rotary path relative to said gas flow means, said rotary cage structure comprising:

a plurality of rigid horizontal support beams extending radially from said vertical axis providing a lower support structure for said rotary cage structure;

a plurality of inner partition members arranged around said vertical axis along a first radially inner perimeter, each of said inner partition members defining respectively the radially innermost side of one of said adsorbent chambers;

a plurality of outer partition members arranged around said vertical axis along a second perimeter located radially outwardly from said first perimeter, each of said outer partition members being located radially opposite one of said inner partition members to define, respectively, the radially outermost side of one of said adsorbent chambers;

a plurality of radial partition members extending radially between said inner and outer partition members each defining on opposite sides thereof the angularly spaced sides of adjoining adsorbent chambers;

with the confines of each of said adsorbent chambers being defined on the radially outermost side by one of said outer partition members, on the radially innermost side by one of said inner partition members, and on the lateral sides thereof by a pair of said radial partition members; and

a plurality of pillars extending vertically from said horizontal support beams and being supported thereon at the lower ends thereof, with one of said vertical pillars being arranged at each of the corners of each of said adsorbent chambers with each of said inner and outer partition members being structurally supported by said pillars and being structurally connected to said radial partition members by said pillars;

each of said pillars being constructed with a hollow interior extending vertically along the length thereof and with apertures formed at least in the lower regions of said pillars to enable introduction therethrough of a cooling fluid into the hollow interiors of said pillars thereby to provide a cooling effect for each of said adsorbent chambers;

with said pillars and said horizontal support beams cooperating to provide a basic support structure for said gas treatment apparatus.

4,490,162

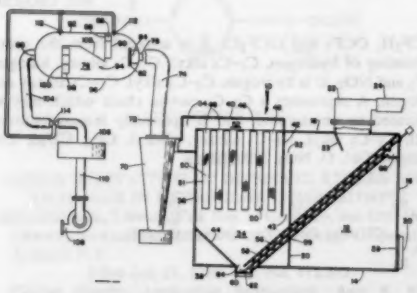
LOW PRESSURE HEPA FILTRATION SYSTEM FOR PARTICULATE MATTER

Charles Davis, Mendham, N.J., assignor to Aaxon Industrial, Inc., Iselin, N.J.

Filed Dec. 20, 1982, Ser. No. 451,191

Int. Cl.³ B01D *50/00*

U.S. Cl. 55—213 **10 Claims**



1. In an improved low pressure filtration apparatus for the collection and removal of particulate matter from an air stream including said particulate matter wherein said apparatus includes sequentially, an intake hose for the introduction of said air stream including said particulate matter into said apparatus, a first enclosed collection chamber having an intake means in flow connection with said intake hose and a removably secured outlet means for removal of a portion of said particulate matter collected in said first collection chamber and an exit means from said first collection chamber for said air stream and a portion of said particulate matter; a second enclosed collection chamber having an intake means for introducing said air stream and said portion of said particulate matter from said first collection chamber, an exit means for said air stream and a portion of said particulate matter from said second enclosed collection chamber; a plurality of vertically disposed filter bags disposed between said intake and exit means of said second collection chamber for removal of a portion of said particulate matter; a cyclone separator having an intake means in communication with said exit means of said second enclosed collection chamber for the further removal of a portion of said particulate matter in said air stream and an exit means; a micron filter screen in communication with said exit means of said cyclone separator for the further removal of a portion of said particulate matter in said air stream; an air pump in communication with said micron filter screen for exhausting said air stream into the atmosphere, the improvement of which comprises:

a third enclosed collection chamber having an intake port in communication with said exit means of said cyclone separator and an outlet port in communication with said micron filter screen for the exit of said air stream from said third enclosed collection chamber to said micron filter screen, said third enclosed collection chamber including a plurality of baffles mounted within said third collection chamber between said intake and outlet ports, substantially perpendicularly disposed to the direction of flow of said air stream and particulate matter, each of said substantially perpendicularly disposed baffles having an intake side and an outlet side from said intake to said outlet parts, each of said substantially perpendicularly disposed baffles having an area less than a cross sectional area of said third enclosed collection chamber and formed with a plurality of openings therethrough, a plurality of high efficiency particulate filters for removing particulate matter of a particle size greater than 0.3 microns mounted on said substantially perpendicularly disposed baffles, coincident with said plurality of openings; a baffle partition secured to said substantially perpendicularly disposed baffles and said third enclosed collection chamber to divide said third enclosed collection chamber into two chambers for directing said flow of said air stream partially through each of said plurality of high efficiency particulate filters mounted on said baffles; a baffle plate positioned proximate to said intake port and perpendicularly disposed to said direction of flow of said air stream so that said baffle reduces the velocity of said air stream and partially directs said air stream through each of said plurality of high efficiency particulate filters; and means for determining pressure drop across said plurality of high efficiency particulate filters.

4,490,163

METHOD OF MANUFACTURING A FIBER-OPTICAL COUPLING ELEMENT

Cornelis M. G. Jochem; Giok D. Khoe, and Antonius J. A. Nicia, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,889

Claims priority, application Netherlands, Mar. 22, 1982, 8201167

Int. Cl.³ C03B *37/14;* **G02B** *7/26*

U.S. Cl. 65—4.21 **2 Claims**

1. A method of manufacturing a fiber-optical coupling element, said method comprising the steps of:

providing at least two monomode fibers, each monomode fiber comprising a glass core and a glass cladding sur-

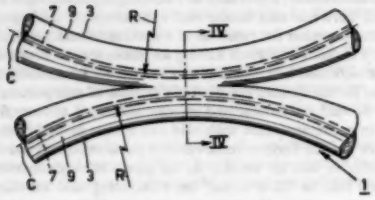
rounding the core, the glass cladding have a softening temperature which is lower than the softening temperature of the glass core;

positioning the two fibers so that their claddings are partially in contact with each other;

heating the fibers where they contact each other to soften the glass claddings thereof, but not the cores;

pressing the fibers toward each other to reduce the distance between the cores of the portions of the fibers which contact each, and to fuse the two fibers together; and

cooling the fibers to room temperature to fix the fusion;



characterized in that:

the glass core of each fiber has an American softening temperature at least 80° C. higher than the American softening temperature of the glass cladding of the fiber;

the fibers are heated to a temperature between 520° and 560° C.;

at the heating temperature, each glass core has a viscosity between $10^{11.5}$ and $10^{9.7}$ poises; and

at the heating temperature each glass cladding has a viscosity between $10^{9.6}$ and $10^{7.7}$ poises.

4,490,164

MOULD ARRANGEMENT FOR USE IN A GLASSWARE CONTAINER MANUFACTURING MACHINE

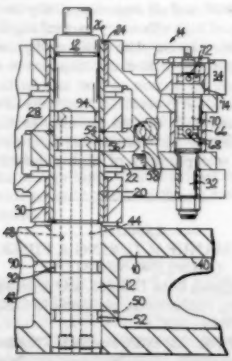
Hermann H. Nebelung, Zurich, Switzerland, and Werner-Dieter Knoth, Essen, Fed. Rep. of Germany, assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Nov. 21, 1983, Ser. No. 553,939

Claims priority, application United Kingdom, Dec. 2, 1982, 8234406

Int. Cl.³ C03B 9/20

U.S. Cl. 65—263 **5 Claims**



1. A mould arrangement for use in a glassware container manufacturing machine comprising two mould portion carriers arranged to carry opposed mould portions, a column on which the carriers are both supported for pivoting movement about the column either towards one another to bring opposed mould portions into engagement with one another or away from one another to move opposed mould portions into mould open positions thereof, and cooling means operative to cool mould portions supported by the carriers, characterised in that the cooling means comprises two passages passing longitudinally through the column, one of the passages being associated with each of the carriers, each passage being connected at one end portion thereof to a source of air under pressure and at an opposite end portion thereof to a passage in the carrier, the passage in the carrier being connected to passages in a mould portion supported by the carrier so that air entering the passage in the column passes into the passages in the mould portion, and the sources of air under pressure associated with each of the passages in the column being controllable independently of one another to vary the flow of air to the passages in the mould portion.

4,490,165

META-(PHENYLALKOXY)PHENYL-N-METHOXY-N-METHYLUREA COMPOUNDS, METHODS FOR PREPARING SAME AND HERBICIDAL USE THEREOF

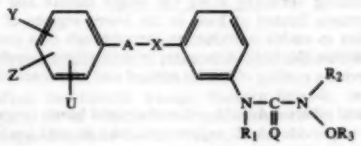
David M. Spatz, Trenton, and Barrington Cross, Rocky Hill, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 152,879, May 23, 1980, Pat. No. 4,308,213, which is a continuation of Ser. No. 30,676, Apr. 16, 1979, abandoned. This application Sep. 14, 1981, Ser. No. 301,855

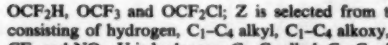
Int. Cl.³ A01N 43/00, 31/00, 41/00; C07C 83/10

U.S. Cl. 71—88 **10 Claims**

1. A method for the selective control of broadleaf weeds in the presence of agronomic crops, said method comprising: applying, as the active ingredient, to said weeds or to soil containing the seeds of said weeds a herbicidally-effective amount of a compound of the formula:

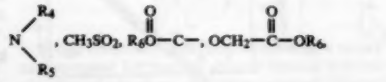


wherein X is selected from O, S, SO and SO_2; Q is O or S; Y is selected from the group consisting of hydrogen, halogen, C_1–C_4 alkyl, C_2–C_5 alkenyl, C_2–C_5 alkynyl, C_1–C_4 alkoxy, CH_3S, CH_3SO_2, CF_3, CN, NO_2, NH_2, C_1–C_3 alkylamino, NHCHO,



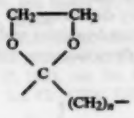
OH, OSO_2CH_3,

OCF_2H, OCF_3 and OCF_2Cl; Z is selected from the group consisting of hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, CF_3 and NO_2; U is hydrogen, C_1–C_3 alkyl, C_1–C_3 alkoxy and halogen; A represents a C_2–C_6 carbon chain which may be saturated or unsaturated, and is optionally monosubstituted with C_1–C_3 alkyl, C_1–C_3 alkoxy, phenyl, CF_3, CH_3S, CN, halogen, OH, O, NO_2, NHCHO,



or is optionally disubstituted wherein one of the substituents is

selected from the hereinabove-named groups and the second substituent is selected from C_1–C_4 alkyl and halogen; or A is a moiety represented by the formula,



wherein n is an integer from 1 to 5; R is C_1–C_4 alkyl; R_1 is selected from hydrogen, CH_3 and CHO; R_2 is selected from hydrogen, C_1–C_2 alkyl, C_3 alkenyl and C_3 alkynyl; R_3 is selected from C_1–C_3 alkyl, C_3 alkenyl and C_3 alkynyl, with the proviso that one of R_1 and R_2 must be hydrogen or CHO; R_4 and R_5 each are hydrogen or C_1–C_3 alkyl; R_6 is C_1–C_3 alkyl.

4,490,166

IMINOPHENYL N-METHYLCARBAMATES AS HERBICIDE EXTENDERS

Daniel L. Hyzak, Austin, Tex., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 383,427, Jun. 1, 1982, abandoned, which is a continuation of Ser. No. 255,515, Apr. 20, 1981, abandoned. This application Mar. 7, 1983, Ser. No. 472,460

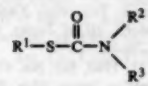
The portion of the term of this patent subsequent to Apr. 26, 2000, has been disclaimed.

Int. Cl.³ A01N *37/00*

U.S. Cl. 71—100 **7 Claims**

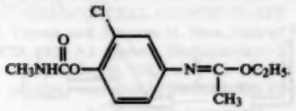
1. An herbicidal composition of extended soil life comprising

(a) an herbicidally effective amount of a thiocarbamate having the formula



in which R^1, R^2, and R^3 are independently C_2–C_4 alkyl; and

(b) an amount of an iminophenyl N-methylcarbamate sufficient to extend the soil life of said thiocarbamate, said iminophenyl N-methylcarbamate having the formula



4,490,167

OXIME DERIVATIVES OF DIPHENYL ETHERS AND THEIR USE IN HERBICIDAL COMPOSITIONS

Georg Pissiotas, Lörrach, Fed. Rep. of Germany, and Otto Rohr, Therwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

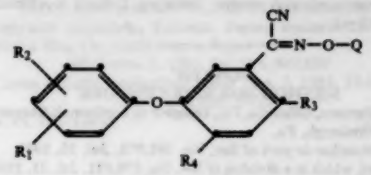
Filed Jul. 25, 1980, Ser. No. 172,312

Claims priority, application Switzerland, Aug. 6, 1979, 7197/79

Int. Cl.³ A01N *37/34*; C07C *121/60*

U.S. Cl. 71—105 **14 Claims**

1. A compound of the formula



wherein

R_1 is halogen, nitro, cyano or trifluoromethyl,

R_2 is hydrogen, halogen, nitro or cyano,

R_3 is halogen, nitro or cyano,

R_4 is hydrogen or halogen, and

Q is lower alkanecarboxylic acid ester or lower alkanethiocarboxylic acid ester.

12. A herbicidal composition which comprises a herbicidally effective amount of at least one oxime derivative of a diphenyl ether according to claim 1 or 2, and a carrier.

13. A method of selectively controlling weeds in crops of cultivated plants, which comprises applying to said crops a herbicidally effective amount of a compound according to claim 1 or 2.

4,490,168

PROCESS OF MAKING STEEL BY MELTING SPONGE IRON IN AN ELECTRIC ARC FURNACE

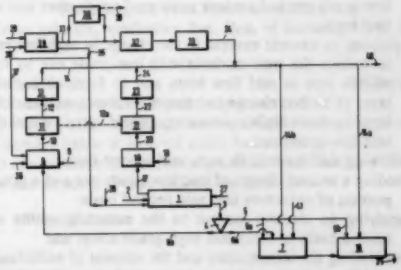
Lothar Formanek, Frankfurt am Main; Martin Hirsch, Friedrichsdorf; Wolfram Schnabel, Idstein; Harry Serbent, Hanau am Main; Klaus-Dietrich Fritzsche, Oberhausen; Heribert Koenig, and Detmar Arlt, both of Duisburg, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main and Mannesmann AG, Dusseldorf, both of, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 569,710

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1983, 3300867

Int. Cl.³ C21B *1/06*

U.S. Cl. 75—10 R **25 Claims**



1. A process for making steel which comprises:

(a) directly reducing iron oxide containing ore;

(b) feeding at least a portion of the product of step (a) to an electric reducing furnace to form a carbon-containing molten iron;

(c) feeding said carbon-containing molten iron from step (b) to an electric arc furnace and forming a pool in said electric arc furnace;

(d) introducing sponge iron produced in step (a) into said pool of molten iron and forming steel from sponge iron and said molten iron; and

(e) controlling the operations of said electric reducing furnace in dependence upon the amount of electric power consumed by said electric arc furnace such that the total

amount of electric energy consumed by said electric arc furnace and said electric reducing furnace is virtually stabilized.

4,490,169

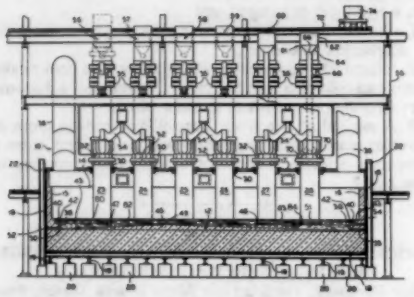
METHOD FOR REDUCING ORE

John A. Persson, Gibsonia, Pa., assignor to Lectromelt Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 281,973, Jul. 10, 1981, abandoned, which is a division of Ser. No. 170,651, Jul. 21, 1980, Pat. No. 4,307,872. This application Oct. 26, 1983, Ser. No. 545,681

Int. Cl.³ C22B 4/06

U.S. Cl. 75—11 19 Claims



1. A method of preparing a high-grade alloy from a low-grade ore, said low-grade ore comprising oxides of iron and a certain metal and said high-grade alloy comprising iron and a percentage of said metal which is greater than that present in said low-grade ore, said method comprising the steps of:

providing an electric furnace having a hearth, said hearth being divided by divider means into first and second basins, said furnace further comprising electrodes in said first and second basins;

feeding a first charge consisting of a major portion of said low-grade ore and a minor portion of a reductant into said first basin;

applying an electric current to the charge in said first basin to reduce the iron oxide in said low-grade ore to form molten iron in said first basin and to form an enriched layer of molten charge and slag thereabove, said enriched layer having a higher percentage of said certain metal than said low-grade ore;

allowing said layer to flow to said second basin;

feeding a second charge of said low-grade ore and a greater portion of reductant into said second basin;

applying an electric current to the materials within said second basin to form said high-grade alloy; and

controlling the temperature and the amount of reductant in said first and second basins to cause substantially only iron to be reduced in said first basin and to form said high-grade alloy in said second basin.

4,490,170

METHOD FOR FORMING A DIRECTIONAL AND CONTROLLED SUSPENSION SPRAY OF A PULVEROUS MATERIAL AND A REACTION GAS

Launo L. Lilja, and Valto J. Mikitalo, both of Pori, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Nov. 8, 1982, Ser. No. 440,387

Claims priority, application Finland, Nov. 27, 1981, 813808

Int. Cl.³ C22B 5/12

U.S. Cl. 75—26 4 Claims

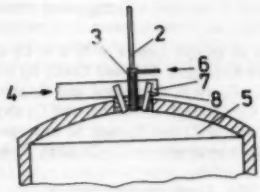
1. A method for forming a directional and controlled suspension spray of a pulverous material and a reaction gas, comprising:

(a) providing a reaction chamber having a dispersing member attached thereto;

(b) providing a reaction gas;

(c) providing a primary dispersion gas;

(d) forming an admixture by mixing said pulverous material with said primary dispersion gas within said dispersing member;



(e) continually feeding said admixture into said reaction chamber through a downward flow;

(f) continually feeding said reaction gas into said reaction chamber in a plurality of at least partially turbulent jets formed symmetrically around said downward flow of said admixture thereby causing said turbulent jets of said reaction gas to discharge into said downward flow of said admixture gas, thereby producing a turbulent but controlled suspension spray comprised at least in part of said admixture having a selectively predetermined pattern.

4,490,171

METHOD AND APPARATUS FOR INJECTING PULVERIZED FUEL INTO A BLAST FURNACE

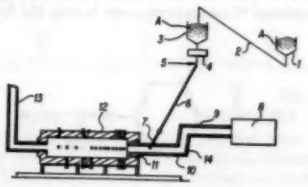
Tomio Suzuki, Kobe; Setsuo Tamura, Nishinomiya; Kozo Tanaka, Miki; Ryoichi Hirose; Hiroyuki Komatsu, both of Kobe; Shinichi Tamada, Himeji; Taketsugu Kasai, Kobe, and Keisuke Tanimoto, Fujiidera, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed Mar. 21, 1983, Ser. No. 477,489

Claims priority, application Japan, Mar. 31, 1982, 57-54231; Mar. 31, 1982, 57-47172[U]; Mar. 31, 1982, 57-47169[U]; Mar. 31, 1982, 57-54230

Int. Cl.³ C21B 7/16

U.S. Cl. 75—42 28 Claims



1. A method for injecting a pulverized fuel into a blast furnace having a tuyere having cooling means and a blow pipe connected to said tuyere at a boundary plane and an injecting burner protruding into said blowpipe, said method comprising the steps of:

introducing hot blast air through said blow pipe and into said tuyere;

introducing a pulverized fuel into said blow pipe through said injecting burner; and

positioning an outlet of said injecting burner in a range of between 100 and 350 mm upstream from said boundary plane.

4,490,172

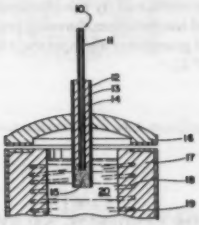
METHOD OF MELTING AND REFINING STEEL AND OTHER FERROUS ALLOYS

William H. Moore, Whitehall Apts.-6E, Whitehall Rd., Chattanooga, Tenn. 37405, and Harry H. Kessler, No. 7 Dromara Rd., St. Louis, Mo. 63124

Continuation of Ser. No. 199,958, Oct. 23, 1980, , which is a continuation of Ser. No. 53,700, Jun. 29, 1979,. This application Jan. 10, 1983, Ser. No. 456,827

Int. Cl.³ C21C 7/02

U.S. Cl. 75—58 11 Claims



9. A process of producing a molten ferrous metal containing an acceptable amount of readily oxidizable metals including silicon and manganese comprising the steps of melting the metal, superheating the molten metal and bubbling CO_2 through the molten metal during the superheating period, said carbon dioxide substantially preventing the oxidation of the readily oxidizable metals while allowing a substantially 5–30% reduction in the carbon content.

4,490,173

STEELMAKING ADDITIVE COMPOSITION

John W. Schwer, 1349 Azalea Dr., Munster, Ind. 46321

Continuation-in-part of Ser. No. 431,540, Sep. 30, 1982,. This application Nov. 28, 1983, Ser. No. 555,716

Int. Cl.³ C21C 7/02

U.S. Cl. 75—58 14 Claims

1. A steelmaking additive composition consisting essentially of from about 25 to 50 wt% lime and about 75 to 50 wt% of a compound selected from the group consisting of bauxite and mixtures of calcium aluminate and bauxite.

4,490,174

PROCESS FOR THE PREPARATION OF A FERRONICKEL CONCENTRATE

Willem J. Crama, and Albertus H. Baas, both of Westervoortsedijk 67D, 6827 AT Arnhem, Netherlands

Filed Nov. 30, 1983, Ser. No. 556,655

Claims priority, application Netherlands, Dec. 22, 1982, 8204940

Int. Cl.³ C22B 23/00

U.S. Cl. 75—82 10 Claims

1. A process for the preparation of a ferronickel concentrate, comprising the steps of:

mixing a sulphur compound and a lateritic ore containing 0.25 to 1.2% wt of nickel and 10 to 50% wt of iron;

reducing the mixture of the sulphur compound and lateritic ore at a temperaure of 920° to 1120° C. with a gas mixture containing CO and CO_2 in a molar ratio of from 60:40 to 100:0, the sulfur compound in the mixture presenting the sole agent controlling particle growth of the metallized nickel-containing phase during reduction;

grinding the reduced reaction product; and

magnetically separating the ground reaction product to produce a magnetic fraction which contains a maximum of 35% of the iron originally contained in the lateritic ore.

4,490,175

VANE FOR ROTARY FLUID COMPRESSORS

Michiyoshi Matsuzaki, Saitama, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1983, Ser. No. 547,616

Claims priority, application Japan, Nov. 2, 1982, 57-191797

Int. Cl.³ C22C 38/22

U.S. Cl. 75—126 C 2 Claims

1. A vane for a rotary fluid compressor, said vane being insertable slidingly in a vane groove of said compressor, characterized in that said vane is made from a steel material consisting essentially of 0.7–1.3 wt % of C, 13–20 wt % of Cr, and at least one of 0.3–1.5 wt % of Mo and 0.07–0.15 wt % of V, the balance being Fe and unavoidable impurity compositions.

4,490,176

FLUID, STABLE FORMULATIONS

Wolf D. Fechner, Dirmstein; Joachim Kranz, Ludwigshafen, and Rudolf Polster, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,232

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1981, 3140519

Int. Cl.³ C09D 11/00

U.S. Cl. 106—23 15 Claims

1. A fluid, stable formulation which contains

(a) a finely divided pigment based on iron cyano complexes, iron-III oxide or iron-III oxide hydrate,

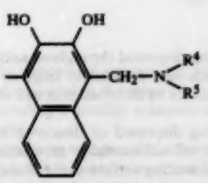
(b) one or more C_6–C_{18}-alkylbenzenesulfonic acids,

(c) one or more compounds of the formula

$$R^3—CH_2—X$$

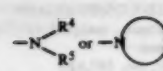
where

R^3 is 2-hydroxynaphth-1-yl, which may or may not contain 1 or 2 additional β-hydroxyl groups, or is



and

X is a radical of the formula

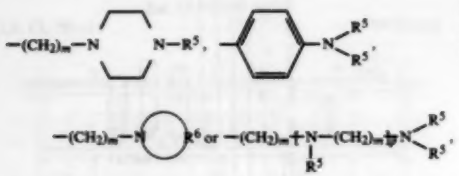


where

R^4 and R^5 are each an aliphatic or phenylaliphatic radical, and may be identical or different, or

R^5 is a group of the formula $—CH_2—R^3$ and

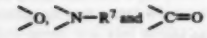
R^4 is a group of the formula



m is 2 or 3,

p is 0, 1 or 2,

is a saturated or unsaturated 5-membered or 6-membered heterocyclic ring which may or may not contain 1, 2 or 3 ring members from the group comprising



and R^7 is C_1–C_4-alkyl, and the compound contains from 1 to 6 hydroxynaphthyl groups, and

(d) one or more organic liquids,

the weight ratio of (b):(c) being from 1:8 to 2:1 and the amount of (c) being from 10 to 20% by weight, based on (a).

4,490,177

DUAL COLOR INK COMPOSITION

Keiko Shioi, Daito, and Yukito Shoji, Suita, both of Japan, assignors to Sakura Color Products Corp., Osaka, Japan

Division of Ser. No. 344,933, Feb. 2, 1982,. This application Oct. 21, 1983, Ser. No. 544,056

Int. Cl.³ C09D *11/00*

U.S. Cl. 106—23 **16 Claims**

1. A method for writing on an absorbent or pervious writing surface to provide a writing composed of an inner portion of a first color with substantial outer contour portions therearound of a second color, which method comprises applying to said surface a writing with an ink comprising:

a first colorant,

a second colorant,

a vehicle,

said first colorant also being dispersed throughout said vehicle and having a particle size sufficiently large so as to substantially not permeate or be absorbed into said writing surface and

said second colorant being dispersed or dissolved in said vehicle, being capable of substantially permeating or being absorbed into said writing surface and diffusing into the area on said surface proximate to said writing

whereby said second colorant forms said outer contour portions around said inner portion of said first colorant.

4,490,178

GRANULATED MATERIAL

Hendrik Loggers, Amerongen, and Gijsbert Versteeg, CK Nunspeet, both of Netherlands, assignors to Aarding Weerstandlas B.V., Netherlands

Division of Ser. No. 254,560, Apr. 15, 1981, abandoned. This application Mar. 11, 1983, Ser. No. 474,835

Claims priority, application Netherlands, Apr. 17, 1980, 8002251; Apr. 17, 1980, 8002252

Int. Cl.³ C04B *7/34*

U.S. Cl. 106—118 **5 Claims**

1. A process for forming granules by simultaneously mixing water, calcium oxide, and fly ash obtained from combustion of coal at elevated temperatures, forming granules of said mixture and curing said granules at a temperature between about 30° C. and about 100° C.

4,490,179

PROCESS FOR RENDERING NACREOUS PIGMENTS HYDROPHOBIC

Horst Bernhard, Schwarzenberg, Austria, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Mar. 25, 1983, Ser. No. 478,767

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211166

Int. Cl.³ C09C *3/08*

U.S. Cl. 106—308 F **18 Claims**

1. A process for rendering nacreous pigments hydrophobic, the pigments being based on mica platelets coated with metal oxides, comprising coating the pigments in aqueous suspension with a chromium (III) or aluminum (III) hydrozide wherein up to 50% of the hydroxide ions can be replaced by silicate ions, and then treating the coated pigments with a solution of a hydrocarbon carboxylic acid having more than four carbon atoms per carboxyl group in an amount and at a temperature effective to react with the hydroxide groups of the chromium or aluminum hydroxide layer whereby the hydrocarbon carboxylic acid becomes bonded to the surface of the pigments rendering them hydrophobic.

15. A hydrophobic nacreous pigment consisting essentially of a mica platelet coated with a metal oxide; and, thereon, a coating of a chromium (III) or aluminum oxide having bonded thereto carboxylic acid residues of more than 4 carbon atoms per originally contained carboxyl group, and wherein up to 50% of the oxide ion sites can be replaced by silicate ions.

4,490,180

METHOD FOR ELECTROHYDROBLASTING OF CASTINGS

Valery V. Prikhodko; Boris V. Kostyrkin, and Pavel I. Tsarenko, all of Nikolaev, U.S.S.R., assignors to Proektno-Konstruktorskoe Bjuro Elektrogidravliki Akademii Nauk Ukrainskoi SSR, Nikolaev, U.S.S.R.

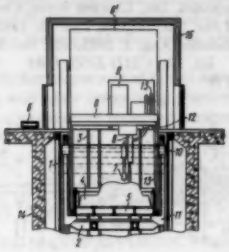
Filed Apr. 13, 1982, Ser. No. 367,878

Int. Cl.³ B22D *29/00*

U.S. Cl. 134—1 **6 Claims**

1. A method for electrohydroblasting of castings in a liquid medium with a view to removing core and molding sand, which comprises subjecting the castings to a series of electrohydraulic shocks created by an electrode and at the same time setting the castings in reciprocating motion in synchronism

with the electrode at a speed and with a stroke length sufficient to produce a flow of liquid in the internal channels and holes of



the castings and thus remove core and molding sand therefrom.

4,490,181

ALKALINE CLEANING OF TIN SURFACES

Newton W. McCready, Newtown Square, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation of Ser. No. 268,752, Jun. 8, 1981, abandoned, which is a continuation-in-part of Ser. No. 163,566, Jun. 27, 1980, abandoned. This application Nov. 22, 1982, Ser. No. 443,626

Int. Cl.³ C23G *1/18*

U.S. Cl. 134—2 **38 Claims**

1. A process for cleaning tin surfaces to substantially remove soil, lubricants or other contaminants therefrom without visibly etching the tin surface, comprising contacting said surface at a temperature effective to substantially remove said contaminants from the tin surface with an aqueous cleaning solution having a pH about 11 to about 13 comprising an alkaline component in an amount effective to substantially remove said contaminant from the tin surface, and an inhibitor in an amount effective to inhibit etching of the surface, said inhibitor being selected from the group consisting of benzoquinones, and substituted benzoquinones, wherein the substituents on the said substituted benzoquinones are selected from the group consisting of hydroxy, hydrogen, halo, alkyl, alkyldienyl, alkoxy, nitro and cyano.

4,490,182

SEMICONDUCTOR PROCESSING TECHNIQUE FOR OXYGEN DOPING OF SILICON

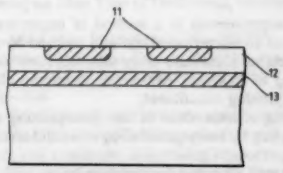
Peter D. Scovell, Chelmsford, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,794

Claims priority, application United Kingdom, Oct. 7, 1980, 8032246

Int. Cl.³ H01L *21/265*

U.S. Cl. 148—1.5 **10 Claims**



1. A method of forming a conductively isolating intrinsic or n-type region in a p-type doped silicon substrate comprising the steps of:

implanting a layer of oxygen ions into a desired region of said substrate at a concentration level substantially corresponding to the doping level of the substrate material; and

heating said substrate to a temperature in the range of about 430° C. to about 470° C. for a period of time sufficient to convert said layer into an isolating region having an intrinsic to n-type conductivity level.

4,490,183

METHOD OF REACTIVATING IMPLANTED DOPANTS AND OXIDATION SEMICONDUCTOR WAFERS BY MICROWAVES

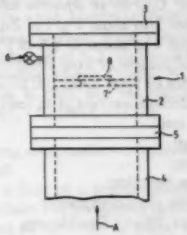
Peter D. Scovell, Chelmsford, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Aug. 31, 1982, Ser. No. 413,327

Claims priority, application United Kingdom, Sep. 17, 1981, 8128127

Int. Cl.³ H01L *21/263;* H05B *9/03;* C23C *11/00*

U.S. Cl. 148—1.5 **7 Claims**



1. A method of oxidizing a silicon body including:

arranging the body in a sealable chamber comprising a length of microwave waveguide;

introducing an oxygen ambient atmosphere at a pressure of approximately 20 atmospheres in the chamber; and

pulse heating the body by directing microwaves into said chamber for a predetermined time.

4,490,184

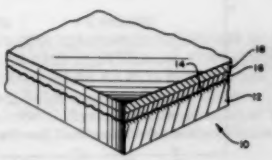
CORROSION RESISTANT THERMAL CONTROL MATERIAL AND PROCESS

Brennan A. Forcht, and Gerald F. Thomas, both of Arlington, Tex., assignors to LTV Aerospace and Defense Co., Dallas, Tex.

Filed Sep. 23, 1982, Ser. No. 422,134

Int. Cl.³ G02B *5/08*

U.S. Cl. 148—6.21 **8 Claims**



1. The process of preparing a corrosive resistant reflective material comprising the steps of:

(a) abrading a metallic substrate to produce a slightly rough surface;

(b) anodizing said metallic substrate;

(c) depositing a thin film of a substantially pure metal upon the anodized substrate;

(d) polishing said thin film of substantially pure metal to reflectance above about 95%; and

(e) coating said reflective metal with a protective organic coating.

4,490,185

PHOSPHATING SOLUTIONS AND PROCESS

Karl-Heinz Gottwald, Erftstadt, and Reinhard Opitz, Duren, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,746

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1982, 3244715

Int. Cl.³ C23F 7/10

U.S. Cl. 148—6.15 Z 20 Claims

1. A process for phosphating a metal surface comprising contacting said metal surface at a temperature of from about 22° to about 38° C. with an aqueous solution consisting of:

(a) from about 2 to about 6 g/l of Zn;

(b) from about 4 to about 23 g/l of PO_4^{-3};

(c) a free acid content of from about 0.05 to about 0.4 points;

(d) a pH value of from about 3.0 to about 4.0; and, optionally, an effective amount of at least one of the following:

(e) chlorate ion;

(f) nitrate ion;

(g) nitrite ion;

(h) hydrogen peroxide;

(i) an aromatic nitro compound;

(j) a simple or SiF_6^{-2} fluoride ion;

(k) a complexing agent;

(l) nickel ion;

and wherein the ratio of Zn to PO_4^{-3} is in the range of from about 1:2 to about 1:11.

4,490,186

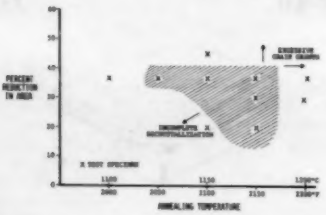
THERMAL-MECHANICAL WORKING OF WROUGHT NON-HARDENABLE NICKEL ALLOY

Roger B. Sines, Manchester; Thomas T. Field, Killingly, and Patrick F. Papineau, Marlborough, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 10, 1982, Ser. No. 440,674

Int. Cl.³ C22D 1/10

U.S. Cl. 148—11.5 N 3 Claims



1. In the fabrication of a welded structure of a wrought alloy consisting essentially by weight percent of 22 Cr, 1.5 Co, 18.5 Fe, 9 Mo, 0.1 C, 0.6 W, balance Ni, the method of providing good fatigue life to a weld zone which comprises cold working the weld zone to reduce the cross section thereof by at least 5%, thereafter heat treating the weld zone at a temperature of 1125°–1175° C. to recrystallize the weld zone; and continuing the heat treatment for about one hour to produce therein a grain size of ASTM No. 4–8.

4,490,187

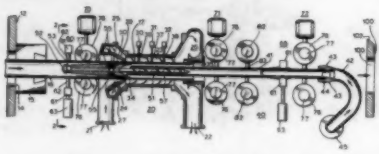
METHOD FOR HEAT TREATING STEEL

Frederick W. Kruppert, Goulais River, Canada, assignor to Kruppert Enterprises, Inc., Gowlais River, Canada

Continuation of Ser. No. 348,694, Feb. 16, 1982, abandoned. This application Aug. 2, 1983, Ser. No. 519,704

Int. Cl.³ C21D 8/00, 1/84

U.S. Cl. 148—12 R 28 Claims



1. A process for heat treating a piece of steel comprising the steps of:

heating the piece of steel; and

quenching each segment of the piece of steel to a desired temperature and thereafter controlling the temperature of the piece of steel by directing a sufficient amount of liquid cooling medium such that at least a material portion of the liquid cooling medium directly impinges a surface of the segment to lower the temperature of the segment to the desired temperature in a generally rapid and controlled fashion while vaporizing substantially all of the cooling medium by using the inherent heat of the segment to create a vapor blanket around at least one surface of each segment so cooled, said vapor blanket being maintained to control the temperature of the surface.

4,490,188

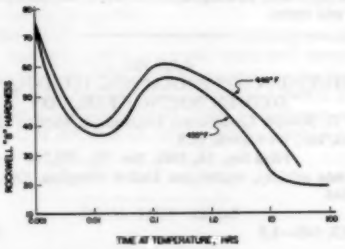
METHOD OF IMPARTING A FINE GRAIN STRUCTURE TO 2000 & 7000 SERIES ALUMINUM ALLOYS

Clifford C. Bampton, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 6, 1981, Ser. No. 280,198

Int. Cl.³ C22F 1/04

U.S. Cl. 148—12.7 A 6 Claims



1. An improvement in a method of imparting a fine grain structure to an aluminum alloy, said method having steps of:

providing an aluminum alloy selected from the group consisting of 2000 and 7000 series aluminum alloys having a precipitating constituent;

dissolving at least some of said precipitating constituent in said alloy by heating said alloy to a solid solution temperature;

cooling said alloy to a temperature below said solid solution temperature;

overaging said alloy at an overaging temperature to form precipitates;

plastically straining said alloy; and

recrystallizing said alloy by heating it above its minimum recrystallization temperature, whereby said precipitates

form nuclei for the recrystallization and controlled growth of a fine grain structure;

said improvement being characterized by the addition of a softening step after said overaging step, said softening step comprising heating said alloy below said overaging temperature;

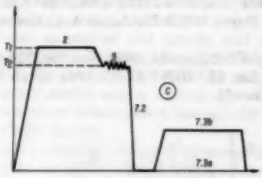
and being further characterized in that said step of plastically straining said alloy comprising plastically straining said alloy at approximately room temperature.

4,490,189

METHOD OF MANUFACTURING STAMPED-OUT OR FORGED PARTS MADE OF ALUMINUM ALLOYS

Roger Develay, Voreppe, France, assignor to Aluminium Pechiney, Paris, France

Filed Mar. 3, 1983, Ser. No. 471,668
Claims priority, application France, Apr. 13, 1982, 82 06705
Int. Cl.³ C21D 8/00
U.S. Cl. 148—12.7 A 5 Claims



1. A method of manufacturing stamped-out or forged parts made of structurally hardened, high resistance aluminum alloys of the 2000 and 7000 series comprising reheating cast blooms at a temperature T_1 equivalent to that of the homogenization of the alloy considered or heating blooms which are cast or homogenized and pre-wrought at a temperature T_3 equivalent to that of the solution heat treatment of the alloy considered, immediately hot deforming at a temperature T_2, wherein T_2 is lower than or equal to T_1 (or T_3), and wherein the temperature at the end of hot deformation is T'_2, immediately quenching, and natural aging or tempering, or a combination thereof, wherein the cooling between T_1 (or T_3) and T_2 is effected by air blasts or by a mist.

4,490,190

PROCESS FOR THERMOCHEMICAL TREATMENTS OF METALS BY IONIC BOMBARDMENT

Roger Speri, Conflans Sainte Honorine, France, assignor to Societe Anonyme Dite: Vide et Traitement, Neuilly-en-Thelle, France

Filed Mar. 8, 1982, Ser. No. 355,880
Claims priority, application France, Mar. 13, 1981, 81 05107
Int. Cl.³ C23C 11/10
U.S. Cl. 148—16.6 2 Claims

1. Process for thermochemical treatment of metal pieces by ionic bombardment in a rarified atmosphere, equipped with at least an anode and a cathode, comprising supporting the pieces to be treated on said cathode, generating at the pieces to be treated a cold plasma by applying between the anode and the cathode an electrical pulse train in which the width of the pulses is from 1 to 100 microseconds, and the period between the pulses is 100 microseconds to 10 milliseconds, and by heating the pieces independently from the action of the plasma to raise them to and maintain them at the treatment temperature.

4,490,191

COATED PRODUCT AND PROCESS

Thomas E. Hale, Warren, Mich., assignor to General Electric Company, Detroit, Mich.

Filed Dec. 16, 1981, Ser. No. 331,368
Int. Cl.³ B32B 15/04
U.S. Cl. 148—31.5 5 Claims

1. An article for cutting and wear parts comprising:

(i) a hard metal or cemented carbide substrate;

(ii) a surface-oxidized bonding layer adjacent the surface of said substrate, which is capable of adherently accepting an oxide overlayer at coating temperatures of from approximately 800° C. to 1300° C., said bonding layer comprising at least one of the carbides or oxycarbides of tantalum, niobium and vanadium; and

(iii) an oxide wear layer overlying said bonding layer.

4,490,192

STABLE SUSPENSIONS OF BORON, PHOSPHORUS, ANTIMONY AND ARSENIC DOPANTS

Arunava Gupta, Madison; Gary A. West, Dover, and Jeffrey P. Donlan, Basking Ridge, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 8, 1983, Ser. No. 502,360
Int. Cl.³ H01L 21/225
U.S. Cl. 148—188 16 Claims

8. A method of doing semiconductor material comprising, in sequence, the steps of:

(a) depositing on a face of a semiconductor substrate the composition of claim 7 in an amount sufficient to produce a uniform deposit on the order of about 10 to 2000 nm in thickness on the face of the semiconductor substrate;

(b) spinning the semiconductor substrate;

(c) heating said deposit at a temperature sufficient to remove substantially all the organic solvent in the composition from said deposit;

(d) placing the semiconductor substrate in a diffusion furnace, in the presence of a gaseous stream comprising argon or oxygen at a temperature in the range of about 300°-800° C. for a time sufficient to degrade substantially all said polymeric organic binder in said deposit and to produce a uniform coating of finely divided spherical dopant particles on the face of the semiconductor substrate;

(e) heating the semiconductor substrate in the presence of a stream comprising argon or nitrogen at a temperature in the range of about 850° to 1350° C. for a time sufficient to produce the required level of doping; and

(f) treating the face of the semiconductor substrate for a time sufficient to remove any oxidized dopant material present on the face of the semiconductor substrate.

4,490,193

METHOD FOR MAKING DIFFUSIONS INTO A SUBSTRATE AND ELECTRICAL CONNECTIONS THERETO USING RARE EARTH BORIDE MATERIALS

Mousa H. Ishaq, Essex Junction; Stanley Roberts, South Burlington, and James G. Ryan, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

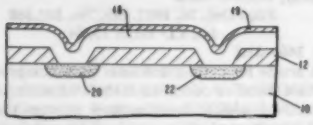
Filed Sep. 29, 1983, Ser. No. 537,128
Int. Cl.³ H01L 21/225, 21/28
U.S. Cl. 148—188 17 Claims

1. A method for diffusing a conductivity determining impurity into a semiconductor substrate and making electrical contact thereto comprising:

depositing a conductive layer of a rare earth boride material over a predetermined surface portion of said substrate;

heating said substrate for a predetermined period of time at a predetermined temperature sufficient to cause boron from said boride material to diffuse into said portion of said substrate so as to modify its conduction characteris-

tics and to establish an electrical ohmic contact between said substrate portion and said conductive layer.



14. A method for making a semiconductor device wherein a conductive layer is patterned to make electrical contact with predetermined regions of said device characterized in that said conductive layer is made of a rare earth boride material.

4,490,194

EMULSION EXPLOSIVE COMPOSITION

John Cooper, Ayrshire, Scotland, and Colin A. Mumme-Young, Chester, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 21, 1983, Ser. No. 515,872
Claims priority, application United Kingdom, Jul. 21, 1982, 8221038
Int. Cl.³ C06B 45/00
U.S. Cl. 149—2 13 Claims

1. An emulsion explosive composition comprising a discontinuous phase containing an oxygen-supplying salt component and an organic medium forming a continuous phase wherein the discontinuous phase additionally comprises an inhibitor capable of at least partially restricting growth and modifying the habit of crystals of the oxygen-supplying salt component.

4,490,195

EMULSION EXPLOSIVE COMPOSITION

John Cooper, Dundonald; David S. Reid, Kilwinning, both of Scotland; Colin A. Mumme-Young, Chester, and Robert D. Gregson, Runcorn, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Oct. 11, 1983, Ser. No. 540,854
Claims priority, application United Kingdom, Oct. 22, 1982, 8230224
Int. Cl.³ C06B 45/00
U.S. Cl. 149—2 9 Claims

1. An emulsion explosive composition comprising an oxygen-supplying salt component as a discontinuous phase and an organic medium forming a continuous phase wherein the composition contains a stabilizer comprising a polycyclic hydrocarbon structure having a lipophilic moiety compatible with the organic medium.

4,490,196

LOW DETONATION VELOCITY EXPLOSIVE COMPOSITION

Richard L. Funk, Budd Lake, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 5, 1984, Ser. No. 597,311
Int. Cl.³ C06B 25/34
U.S. Cl. 149—92 20 Claims

1. An explosive composition comprising
(a) an ester component of the formula

$$ROOC\text{-}\langle A \rangle\text{-}COOR^1,$$

$$[R''\text{-}\langle A \rangle\text{-}O]_3\,[PO_4],\ \text{or}$$

$$R'''\text{-}\langle Ac \rangle_m$$

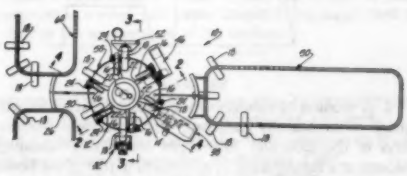
wherein
R and R^1 are separately and individually defined as a lower alkyl group;
A is defined as the nucleus of a substituted or unsubstituted divalent aromatic group;
R'' is an alkyl group of 1–2 carbon atoms;
R''' is an alkyl group of 3–8 carbon atoms;
Ac is an acetyl group; and
m is a whole number of 1–3; with
(b) a component comprising a 40–60:60–40 mixture by weight of metriol trinitrate: diethylene glycol dinitrate; and
(c) an active amount of at least one organic stabilizer component; the ratio by weight of (a)-to-(b) in said composition being about 9–20:91–80.

4,490,197

TIRE CASING PREPARATION METHOD

Jacques J. Bajer, 16825 Kercheval Ave., Grosse Pointe, Mich. 48230

Filed Aug. 22, 1983, Ser. No. 524,927
Int. Cl.³ B29H 17/36, 3/06; G01B 5/00
U.S. Cl. 156—64 1 Claim

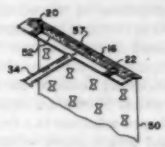


1. In a method of preparing tire casings having worn outer peripheral tread surfaces and sidewall surfaces as well as belt damages for re-treading or re-manufacturing, the steps comprising:
(a) mounting a tire casing on a rotary transfer machine having a turntable which transports the casing sequentially between a plurality of work stations;
(b) first transporting the tire casing by means of the transfer machine to a de-treading work station and performing a rough machining operation on the outer peripheral tread surface of the tire casing for removing the tread surface by cutting a curvilinear surface;
(c) next transporting the tire casing by means of the transfer machine to a contouring or profiling work station, performing a semi-rough machining operation on the outer peripheral surface of the tire casing by machining the outer peripheral surface to an arcuate configuration;
(d) again transporting the tire casing by means of the transfer machine to a finishing and surface conditioning work station and performing a finishing and conditioning operation on the outer peripheral contoured surface of the tire casing including its sidewall portions, by machining the outer peripheral surface of the tire casing including dimensional gauging of the tire casing and detecting any defects that may exist therein;
(e) transporting the finished machined tire casing by means of the transfer machine to an adhesive solution application work station and applying such adhesive solution to the outer peripheral surface thereof; and
(f) removing the finished and prepared tire casing from the transfer machine and transporting the tire casing to a separate work area for re-treading or re-manufacturing.

4,490,198
METHOD OF HANGING WALLPAPER

Larry L. Mitchell, Athens, Ala., assignor to Jimmy R. Bobo and Wilbur P. Fowler, both of Arab, Ala.

Filed Dec. 13, 1982, Ser. No. 449,536
Int. Cl.³ E04B 2/00
U.S. Cl. 156—71 4 Claims



1. The method of hanging wallpaper comprising:
gripping the handle of a wallpaper hanging device, in turn comprising:
an elongated handle, and
an elongated wallpaper guide centrally attached to and extending at right angles with respect to and longitudinally beyond an end of said handle, and said guide having a continuous extreme outer guide edge extending in a direction normal to the direction of extension of said elongated handle and in a plane spaced from and parallel to a plane which passes through the longitudinal axis of said handle,
a pair of spaced clamping means symmetrically attached to said guide on either side of the attachment of said handle, and each said clamping means including means for selectively clamping and unclamping paper;
next, drawing one end region of a length of wallpaper over said guide edge and clamping said end region by said clamping means;
then, with the clamping means on the side of said guide away from a wall and a relative adhesive state between a wall and wallpaper, by movement of said handle, positioning the paper on a wall with said guide edge pressing the paper against a ceiling/wall intersection;
next, holding said handle out from a wall, cutting the paper along the underside of said guide edge, thereby cutting the paper closely adjacent to the ceiling;
then, smoothing the paper downward; and
finally, cutting the lower edge where the paper strikes the boundary of a moulding or floor.

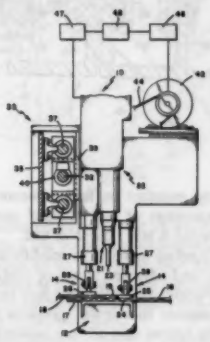
4,490,199
METHOD AND APPARATUS FOR SPLICING POLYMERIC WEBS

Frederick G. Dunning, Richmond, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 1, 1982, Ser. No. 394,064
Int. Cl.³ B29C 27/08; B65H 69/08
U.S. Cl. 156—73.4 15 Claims

1. A method of splicing reinforced polymeric planar sheets having an axial direction, a transverse direction, a leading end, and a trailing end, using an ultrasonic welder and a sheet support means, there being a means to move the ultrasonic welder across the sheet, comprising the steps of:
feeding the trailing end of at least one first polymeric sheet between the ultrasonic welder and the sheet support means;
feeding the leading end of at least one second polymeric sheet between the ultrasonic welder and the sheet support means, with the trailing end of the first polymeric sheet and the leading end of the second polymeric sheet overlapping;
securing the first polymeric sheet and the second polymeric sheet with the overlapping portions of the trailing end of the first sheet and leading end of the second sheet located between the ultrasonic welder and the sheet support means;
bringing the ultrasonic welder into contact with one side of the overlapping polymeric sheets and with the sheet support means in contact with the opposite side of the overlapping polymeric sheets;
moving the ultrasonic welder across the sheet; and
repeatedly spot welding the overlapping polymer sheets together across the transverse direction by repeating the steps of bringing the ultrasonic welder into contact with one side of the overlapping polymeric sheets and with the sheet support means in contact with the opposite side of the polymeric sheets, heating the overlapping polymeric sheets with the ultrasonic welder

9. An appatatus for ultrasonically welding reinforced polymeric sheets naving an axial direction, a transverse dircetion, a leading end and a trailing end comprising:



an ultrasonic welder;
a sheet support means;
a means to secure the trailing end of at least one first sheet and the leading end of at least one second sheet between the ultrasonic welder and the sheet support means, whereby the trailing end of the first sheet and the leading end of the second sheet overlap between the ultrasonic welder and the web support means; a means to move the ultrasonic welder twoard and away from the sheet to bring the ultrasonic welder into contact with the sheet to form spot welds; and an indexing means to control a plurality of spot welds transversely across the sheet, comprising a means to move the spot welder transversely across a sheet, a means to control distance between welds, and a means to control the time of heating and the time pressure is exterted at each weld.

4,490,200
FLEXIBLE, NON-KINKABLE HOSE AND METHOD FOR MAKING THE SAME

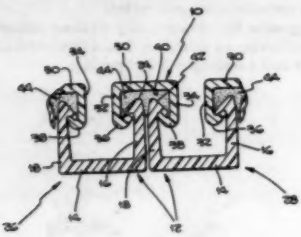
Joseph C. Dillon, 12317 Rochedale La., Los Angeles, Calif. 90049

Division of Ser. No. 365,361, Apr. 5, 1982, Pat. No. 4,420,019.
This application Oct. 4, 1983, Ser. No. 539,072
Int. Cl.³ F16L 11/11
U.S. Cl. 156—143 7 Claims

1. A method for the construction of flexible hose comprising the steps of:
forming a generally annular configuration by helically wrapping a flexible channel member, said channel member forming a continuous strip having a base portion integrally formed with a first and a second wall, said first and second walls having upper edges distal from said base portion, said first wall having a rib integrally formed on an exterior surface thereof, said rib running the length of said channel member and generally parallel to said base portion, said

rib disposed on said exterior surface of said first wall proximate to said upper edge of said first wall, said second wall integrally formed with said base portion opposite said first wall, said first and second walls together with said base portion forming a generally U-shaped cross section channel member, helically wrapping said channel member so that said rib of said first wall is in contact with the exterior surface of said second wall of an adjacent wrap of said channel member;

providing an initially flowable binding material on said upper edges of adjacent first and second walls of said helically wrapped channel member;



disposing a cap member on said adjacent upper edges of adjacent wrappings of said channel member while said binding material is still flowable; and

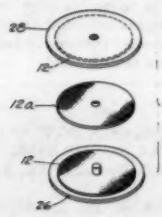
allowing said binding material to solidify in situ to bind said cap member and adjacent wraps of said channel member together, whereby a flexible hose may be easily fabricated in such a manner that lower portions of said first and second walls below said rib are maintained free of said binding material thereby retaining the expandable and flexible characteristics of said channel member.

4,490,201

METHOD OF FABRICATING CARBON COMPOSITES

Donald H. Leeds, Rolling Hills, Calif., assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 10, 1981, Ser. No. 291,309
Int. Cl.³ B32B *31/20*
U.S. Cl. 156—155 **10 Claims**



1. A method of making a carbon composite product comprising the steps of:

(a) selectively depositing a precisely determined, limited amount of a carbonaceous binder material onto a compressible fibrous material;

(b) subjecting said material and binder material to an elevated temperature of about 110° C. for a time period of about 3 seconds to thermally fuse said binder material to the fibers of said material intermittently of the length of said fibers to form a coated material;

(c) cutting said coated material into swatches of a predetermined size and shape;

(d) constructing said swatches into a basic substrate having a volume greater than the volume of the final product;

(e) subjecting said basic substrate to controllable external pressures of up to 5000 psi at a predetermined elevated temperature necessary to thermally fuse said binder material to the fibers of said material to compress said basic substrate into a shaped substrate having a known volume and a shape substantially corresponding to the shape desired of the final product, whereby said fibers are bonded together at a multiplicity of spaced apart bonding sites being free to move in response to stresses imparted to said shaped substrate, said shaped substrate thus formed being rigid, easily handleable and transportable and being capable of further processing without the need for holding fixtures or other means of external support;

(f) subjecting said shaped substrate in a free standing configuration to elevated temperatures while controllably depositing pyrolytic material interstitially thereof, whereby said carbonaceous binder material is carbonized and said fibers are permanently bonded together by said pyrolytic material; and

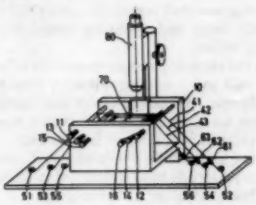
(g) continuing said interstitial deposition of pyrolytic material until the desired final product density is achieved.

4,490,202

DEVICE AND METHOD OF POSITIONING OPTICAL FIBERS

Francois Dumont, Soisy-sur-Seine, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 30, 1983, Ser. No. 480,198
Claims priority, application France, Apr. 7, 1982, 82 06078
Int. Cl.³ B23Q *3/18*; B32B *5/02*
U.S. Cl. 156—166 **10 Claims**



1. A device for positioning at least two wire-shaped articles with respect to each other, each wire-shaped article having two ends, said device comprising:

a support having two sides and a number of holes in the sides, said holes being arranged in pairs opposite each other in the sides of the support, one hole in each pair being threaded;

two groups of pins mounted on the support, each pin mounted in a pair of holes in the sides of the support so as to be parallel to each other, each group comprising a pair of pins located in a horizontal plane, the plane of one pair of pins being above the plane of the other pair of pins, each pin having a threaded portion and a nonthreaded portion, the threaded portion being arranged in a threaded hole in a side of the support, the nonthreaded portion having a groove therein;

means for fixing the ends of each wire-shaped article on the support, said means comprising elastic means for fixing one end of each wire-shaped article so as to maintain the article in tension;

means for translating a movable block between the pins of each pair of pins and perpendicular to the planes of each pair of pins; and

optical means for measuring the positions of the wire-shaped articles;

whereby in operation each wire-shaped article is arranged in

tension in the grooves of a pair of pins so that rotation of the pins displaces the portion of the article between the pins, and the movable block is translated upward so that the portions of the articles between the pins bear on an upper surface of the block.

2. A method of positioning at least two optical fibers by using the device claimed in claim 1, said method comprising the steps of:

fixing the fiber ends to the fixing means;

arranging each fiber in the grooves in a pair of pins, a first fiber being arranged in the grooves of the lower pins, and a second fiber being arranged in the grooves of the upper pins;

adjusting the position of the first fiber by rotating the lower pins while measuring the position thereof with the optical means;

translating the movable block to contact the first fiber and to raise it to nearly the height of the second fiber, but without contacting the second fiber;

adjusting the position of the second fiber by rotating the upper pins while measuring the position thereof with the optical means;

translating the movable block to contact the second fiber;

covering the fibers with a second block and joining the second block to the movable block to keep the fibers in place in a rigid assembly;

cutting the fibers at one end of the rigid assembly; and

polishing the cut fiber ends to be flush with the end of the rigid assembly.

4,490,203

METHOD FOR SLITTING AND/OR SEALING PLASTIC FILM MATERIAL

Ajit Bose, Rexdale, Canada, assignor to Leco, Inc., Rexdale, Canada

Division of Ser. No. 363,074, Mar. 29, 1982, Pat. No. 4,414,051. This application Aug. 17, 1983, Ser. No. 523,872

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—251 **3 Claims**

1. In a method of slitting and sealing two or more layers of plastic film material in contact with each other, the improvement comprising slitting and sealing said layers with a light beam generated by a laser in which the beam intensity is such that the temperature of the beam at the surface of the film is at a point sufficient only to raise the enthalpy of the material to the transition point between the molten and solid states of said material, whereby bead build-up is reduced or eliminated at the seal, and in which the seal strength of the seal is greater than a similar corresponding hot knife seal.

4,490,204

APPARATUS AND METHOD FOR MANUFACTURING SOLAR COLLECTORS

Sherwood G. Benfield, Matthews, N.C., assignor to Unified Technologies, Inc., Charlotte, N.C.

Filed Jan. 4, 1983, Ser. No. 455,470

Int. Cl.³ B32B *31/20*

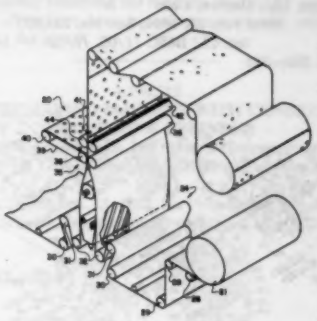
U.S. Cl. 156—290 **10 Claims**

1. Apparatus for manufacturing solar heating devices of a type having bonded together sheets of thermoplastic material forming a flexible wall container for fluid, the apparatus comprising:

feed means for advancing first and second elongate indeterminate length sheets of thermoplastic material longitudinally along respective predetermined paths of travel and for guiding the sheets in a common direction along the paths and into juxtaposition,

heating means mounted adjacent the paths of travel for subjecting opposing inwardly facing localized surface portions of the sheets to dry heat and thereby heating the surfaces to an elevated, bonding temperature,

press means mounted adjacent the paths of travel and at a location at which the sheets are juxtaposed and heated for pressing the sheets together and for bonding the sheets together in a longitudinally repetitive pattern which defines fluid flow passages therebetween, said press means comprising a pair of rolls mounted for rotation about respective axes transverse to the sheets and parallel one to the other and forming a nip, and endless apron means trained about one of said rolls for movement along a closed path of travel and through the nip formed by said pair of rolls and having a ribbed surface for engagement with a sheet passing through the nip and for defining a pattern of bonding for the sheets, and



sealing means mounted adjacent the paths of travel and at a location at which the sheets are juxtaposed and heated for sealing the sheets along transverse lines spaced longitudinally of the sheets at predetermined distances and thereby for dividing the indeterminate length sheets into discrete length flexible wall containers.

5. Apparatus according to claim 1 wherein said heating means comprises a biconvex heater interposed between the juxtaposed sheets immediately in advance of the engagement thereof with said press means for heating opposing inwardly facing surface portions of the sheets to an elevated, bonding temperature.

4,490,205

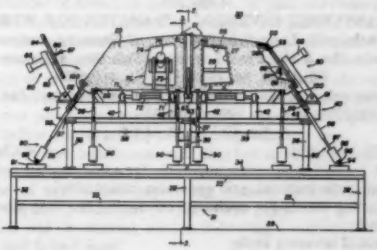
APPARATUS AND METHOD FOR SHAPING FLEXIBLE MATERIAL ON A FORM

John G. Warbol, 14041 Vernon Ave., Oak Park, Mich. 48237

Continuation-in-part of Ser. No. 909,395, May 25, 1978, abandoned. This application Jun. 27, 1980, Ser. No. 163,726

Int. Cl.³ B32B *31/04*; B60J *7/00*

U.S. Cl. 156—351 **22 Claims**



1. Apparatus for applying and shaping on a form a prefabricated material including a thermosetting composition, said apparatus comprising means for tensioning the associated material on the form to a predetermined orientation and shape, heating means disposed for heating the associated material on the form to a predetermined temperature sufficient to insure setting of the thermosetting composition and the material in

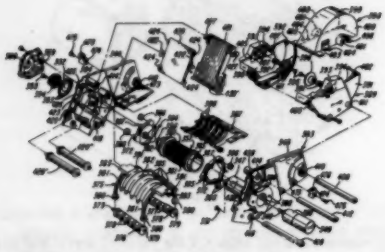
the predetermined shape, sensing means disposed closely adjacent to the prefabricated material for detecting the temperature thereof while it is on the form, and control means coupled to said sensing means and to said heating means and responsive to said sensing means for de-energizing said heating means when the prefabricated material has reached said predetermined temperature.

4,490,206

HAND-HELD LABELER

James A. Makley, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Feb. 28, 1984, Ser. No. 582,337
Int. Cl.³ B65C 11/00, 11/02
U.S. Cl. 156—384 7 Claims



1. A hand-held labeler adapted to print and apply pressure sensitive labels releasably secured to a carrier web, comprising: a housing having a handle, means for mounting a label supply roll on the housing, means for printing on labels including a thermographic print head, means for delaminating printed labels, means for applying printed labels, means for advancing the carrier web, means defining a path for guiding the web from the label roll, to the printing means, to the delaminating means, and to the web advancing means, a protective cover for the label roll, the cover including first and second cover members, the first cover member being secured to the housing, the second cover member being rotatably mounted for movement between an open position in which the second cover member is substantially overlapped relative to the first cover member and a closed position in which the second cover member and the first cover member enclose the label roll, wherein the second cover member includes an arcuate portion and a pair of spaced walls joined to the arcuate portion.

4,490,207

TRANSVERSE SEVERING APPARATUS FOR WEBS

Fritz Achelpohl, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Jan. 24, 1983, Ser. No. 460,625
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1982, 3202272; Feb. 10, 1982, 3204492
Int. Cl.³ B32B 31/18
U.S. Cl. 156—494 4 Claims

1. A transverse severing apparatus for an advancing web of thermoplastic material, said apparatus comprising:

a feeding means for cyclically advancing the web along a path;

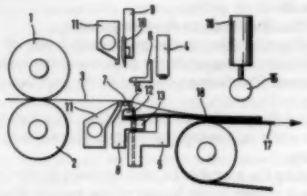
a heated severing knife;

a backing bar positioned on the opposite side of the web from the severing knife cooperating with the severing knife;

a web welding means positioned adjacent to the heated severing knife and the backing bar;

a first pressure bar spaced from the heated severing knife and the backing bar for tensioning the web across the backing bar;

a second pressure bar positioned adjacent to the severing knife and the backing bar on the opposite side of the web welding means, and second pressure bar being movable to a plane spaced from the plane of the web passing between the severing knife and the backing bar for elastically stretching the tensioned web positioned across the backing bar in advance of the web being cut by the severing knife and being welded by the web welding means; and



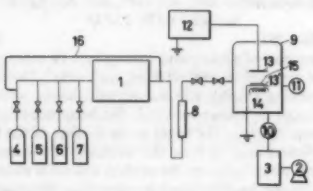
a recess provided below a top surface of the backing bar for receiving cut web and for preventing the cut web from buckling.

4,490,208

METHOD OF PRODUCING THIN FILMS OF SILICON

Kazunobu Tanaka; Akihisa Matsuda, both of Ibaraki, and Toshihiko Yoshida, Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jul. 1, 1982, Ser. No. 394,074
Claims priority, application Japan, Jul. 8, 1981, 56-105703; Jul. 8, 1981, 56-105704
Int. Cl.³ C30B 25/02
U.S. Cl. 156—606 14 Claims



1. A method of producing a thin film of silicon comprising subjecting a thin film of silicon doped with an impurity element to a plasma atmosphere consisting essentially of gas selected from the group consisting of fluorine, chlorine, bromine, iodine, hydrogen and mixtures thereof to reduce the concentration of the impurity element in the doped silicon film adjacent to a surface of the silicon film by removing at least a portion of the impurity element adjacent to the surface of the silicon film.

4,490,209

PLASMA ETCHING USING HYDROGEN BROMIDE ADDITION

Dennis C. Hartman, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

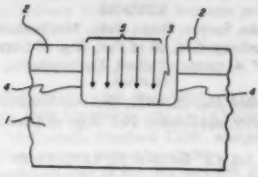
Filed Dec. 27, 1983, Ser. No. 566,128
Int. Cl.³ H01L 21/306; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 15 Claims

1. The method for selectively etching a layer of a silicon-bearing material in an integrated circuit, comprising the steps of:

providing a patterned masking material over said silicon-bearing material to expose only the areas of said silicon-bearing material which are to be etched;

passing a gaseous mixture over said layer; and

creating a plasma discharge in said gaseous mixture adjacent to said layer of silicon-bearing material;

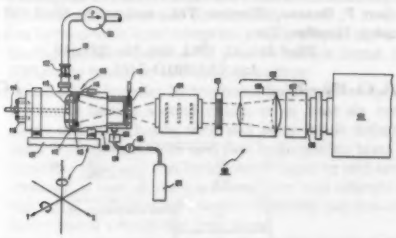


wherein said gaseous mixture comprises hydrogen bromide and a chlorine-bearing species.

4,490,210
LASER INDUCED DRY CHEMICAL ETCHING OF METALS

Lee Chen, Poughkeepsie, N.Y.; Tung J. Chuang, Los Gatos, Calif., and Gangadhara S. Mathad, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 24, 1984, Ser. No. 573,451
Int. Cl.³ C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 23 Claims



1. A method of radiation induced dry etching of a metallized substrate comprising the steps of:

(a) mounting the substrate in a reaction chamber,

(b) establishing a predetermined low pressure in the chamber;

(c) controllably introducing a selected gas into the chamber to form a solid reaction product with the metal by a partial consumption of said metal; and

(d) selectively removing the reaction product by applying a beam of laser radiation and thereby selectively etching the metal.

4,490,211
LASER INDUCED CHEMICAL ETCHING OF METALS WITH EXCIMER LASERS

Lee Chen, Poughkeepsie; John R. Lankard, Mahopac, and Gangadhara S. Mathad, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

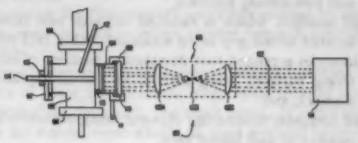
Filed Jan. 24, 1984, Ser. No. 573,452
Int. Cl.³ C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 10 Claims

1. A method of radiation induced dry etching of a metallized substrate comprising the steps of:

(a) mounting the substrate in a reaction chamber;

(b) establishing a predetermined low pressure in the chamber;

(c) controllably introducing a selected gas into the chamber to form a solid reaction product with the metal by a partial consumption of the surface of said metal; and

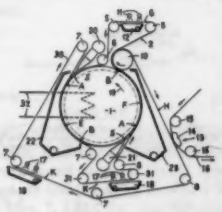


(d) selectively removing the reaction product by applying a beam of excimer laser radiation and thereby selectively etching the metal.

4,490,212
PAPERMAKING MACHINE WITH CENTRAL DEWATERING CYLINDER

Rüdiger Kurtz, Immenstaad, Fed. Rep. of Germany, assignor to Escher Wyss GmbH, Ravensburg/Württ, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,687
Claims priority, application Switzerland, Sep. 22, 1982, 5595/82
Int. Cl.³ D21F 1/60, 11/08
U.S. Cl. 162—298 6 Claims



1. A papermaking machine comprising:

an endless water pervious inner dewatering band having an inner side and an outer side;

means defining at least two dewatering surfaces each including a dewatering section;

said dewatering sections being arranged in series;

said inner side of said inner dewatering band extending around said at least two dewatering sections and defining wrap-around sections;

at least one endless water pervious outer dewatering band;

a number of infeed elements for said at least one outer dewatering band for infeeding a respective portion of said at least one outer dewatering band to a respective one of said wrap-around sections;

each of said wrap-around section of said inner dewatering band and a respectively associated portion of said at least one outer dewatering band being convergently guided to define a substantially wedge-shaped infeed gap;

at least two headboxes each directed towards a respective one of said infeed gaps to form fiber layers;

one of said infeed gaps being located downstream with respect to the other of said infeed gaps;

each said dewatering section following a respective one of said infeed gaps;

said at least one outer dewatering band comprising a common endless outer band which is guided along said outer side of said inner dewatering band over each said dewatering section;

deflecting means operatively associated with each said dewatering section for returning said common endless outer band to each said infeed gap;

said common endless outer band being guided in spaced

relationship from said inner dewatering band and forming an open loop towards said inner dewatering band between said dewatering sections;

said headbox which is directed towards said downstream located infeed gap being arranged within said open loop;

said series arranged two dewatering sections of said dewatering surfaces being formed at a common dewatering element; and

said common dewatering element being centrally arranged relative to said infeed gaps.

4,490,213

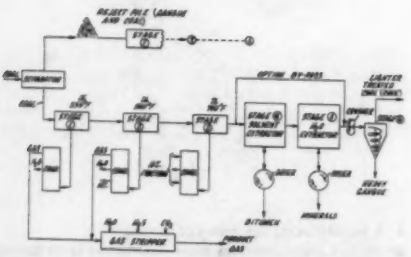
COAL CONVERSION PROCESSES

Myron L. Anthony, Grand Junction, Colo., assignor to EPIC Research Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 331,138, Dec. 16, 1981, abandoned. This application Apr. 21, 1983, Ser. No. 487,262

Int. Cl.³ C10B 55/06; C10L 9/04, 9/08

U.S. Cl. 201—17 7 Claims



1. A method of converting coal to a porous easily crushed coke, which may be slurried with water for pipeline transport, by roasting the coal in selective increasing thermal stages below its combustion temperature in a refluxing retort thereby substantially to avoid pollution and thermal reaction products inimical to health and comprising the following process steps all of which are performed inside the retort, commencing with charging the coal into the retort near the top thereof where it is cooler and culminating in the coke product being withdrawn from the bottom of the retort where it is hotter:

A. heating the coal in a refluxing retort to vaporize to a gas substantially all the water and drive off substantially all the low vapor pressure hydrocarbon gases and higher vapor pressure hydrocarbon gases which may be present; the heat in-put being near the bottom of the retort and said gas being recovered near the top of the retort;

B. heating the coal resulting from step A at a higher temperature stage in said refluxing retort to volatilize hydrocarbon liquids which are recovered at one or more intermediate points along the length of the retort, causing delamination and porosity within the coal and resulting in a coke product recovered at the bottom of the retort; and

C. refluxing back to the retort at a point considerably below the point where the coal is introduced at least part of the hydrocarbon gases of step A serving as hydrogen donors to the process, the movement of the reflux being counter to the movement of coal thus aiding in separating the downward moving coal.

4,490,214

PROCESS FOR THE PREPARATION OF STORAGE-STABLE ALKYLENE GLYCOL MONOALKYL ETHERS

Horst G. Bosche, Speyer; Heinz Nohe, Meckenheim, and Heinz Pachaly, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 25, 1982, Ser. No. 392,088

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125107

Int. Cl.³ B01D 3/34; C07C 41/42

U.S. Cl. 203—6 5 Claims

1. In a process for the preparation of storage-stable alkylene glycol monoalkyl ethers having the general formula

$$R—(O—A—)_nOH \quad (I)$$

in which A denotes an ethylene or propylene group, R represents a C_1 to C_4 alkyl group, and n has a value of 1 to 4, which involves the fractional distillation of a glycol ether mixture which is obtained by the alkali catalyzed reaction of ethylene oxide or propylene oxide with an alcohol, the improvement comprises carrying out the fractional distillation in the presence of 0.1 to 20 ppm of ammonia, relative to the amount of mixture used.

4,490,215

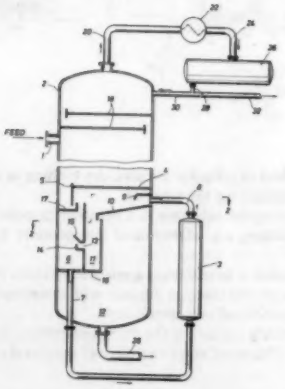
PROCESS FOR FRACTIONATION REBOILING

Robert P. Bannon, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 12, 1982, Ser. No. 397,640

Int. Cl.³ B01D 3/16

U.S. Cl. 203—98 2 Claims



1. A process for improving the stability of operation of a fractional distillation system having an upright vapor-liquid contacting fractionator, which process comprises:

collecting substantially all of a down flowing liquid from a bottom vapor-liquid contacting means in a reboiler feed compartment,

withdrawing liquid exclusively from said reboiler feed compartment for reboiling,

passing said liquid to a reboiler, wherein said liquid is partially vaporized,

passing the resulting partially vaporized liquid from the reboiler to a separate reboiler return liquid compartment,

equalizing the liquid level in the reboiler feed compartment and the reboiler liquid return compartment via means for liquid communication between said compartments said means being disposed above the bottom of said reboiler

liquid return compartment, thereby forming a settling zone within said liquid return compartment, and

overflowing liquid from the reboiler liquid return compartment to a lower fractionator bottoms product compartment.

4,490,216

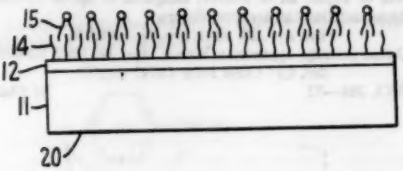
LIPID MEMBRANE ELECTROANALYTICAL ELEMENTS AND METHOD OF ANALYSIS THEREWITH

Harden M. McConnell, Stanford, Calif., assignor to Molecular Devices Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 463,577, Feb. 3, 1983, abandoned. This application Jan. 12, 1984, Ser. No. 570,063

Int. Cl.³ C12Q *1/00*

U.S. Cl. 204—1 T **23 Claims**



1. A device sensitive to changes in polarity, comprising:

a solid electrically conductive layer having a first surface for binding by chemical means and responsive to changes in polarity adjacent to said first surface;

a first hydrophobic layer comprising a plurality of molecules having aliphatic chains of at least six carbon atoms, non-diffusively bound to said binding surface;

a second stable lamellar hydrophobic lipid layer comprising molecules having second chains of at least six carbon atoms and polar heads, with said polar heads defining a polar layer distant from said first hydrophobic layer and separated from said first hydrophobic layer by said second chains of at least six carbon atoms layer, and wherein said individual molecules are laterally diffusible and non-covalently bound to said first lipid layer;

wherein said first and second hydrophobic layers define a bilayer membrane.

8. A method for detecting a change in the polarity of a polar medium which comprises contacting a device according to claim 1 with said polar medium and a reference electrode; and detecting the change in potential between said electrode and said device by effecting a change in the polar state of said medium adjacent to said device.

4,490,217

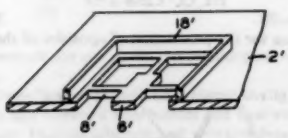
METHOD OF MAKING A STENCIL PLATE

Charles R. Culp, Lancaster, and Stephen G. Mearig, Mountville, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Feb. 24, 1984, Ser. No. 583,197

Int. Cl.³ C25D *1/08*

U.S. Cl. 204—11 **2 Claims**



1. The method of forming a flat stencil plate, the steps comprising:

(a) placing a first resist coating on the surface of a matrix,

(b) placing a film artwork over all the surface of the resist coating opposite from the side of the resist coating against the matrix,

(c) exposing the film artwork and resist coating to sensitize the resist coating in select regions beneath the film artwork,

(d) developing the exposed resist coating to provide a pattern of resist material with large open areas of no-resist material on the matrix and small islands of resist material on the matrix, some islands of resist material having open areas in the center thereof and channel means connecting these open areas in the islands with large open areas on the matrix,

(e) then plating the surface of the matrix to deposit material in the large open areas, the open areas in the islands of resist material and in the channel means connecting said above two open areas to form on the matrix the deposited material in the form of large areas of deposited material with apertures therein where the resist material was present during plating and in some of the apertures there being small deposits of the plating material in the center region of the apertures with channels of depositing material connecting the small deposits of the plating material to the edges of the apertures, and

(f) removing resist material and the matrix from the plated material to permit the deposited material to form a flat stencil plate with apertures therethrough and some apertures having deposited material within the center region of the apertures.

4,490,218

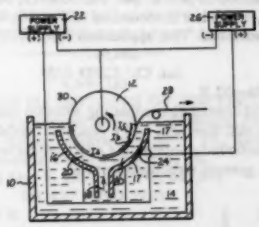
PROCESS AND APPARATUS FOR PRODUCING SURFACE TREATED METAL FOIL

Igor V. Kadija, Cheshire, and James E. Oxley, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 7, 1983, Ser. No. 549,102

Int. Cl.³ C25D *1/04, 17/00*

U.S. Cl. 204—13 **21 Claims**



1. A process for producing surface treated metal foil, said process comprising:

providing an electrolytic cell having an electrolyte and a cathodic surface immersed in said electrolyte, said electrolyte containing a concentration of metal ions;

applying a first current density in a first zone for plating a relatively smooth metal foil deposit on said cathodic surface; and

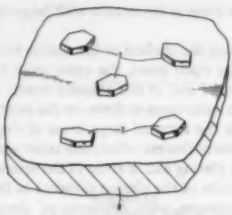
superimposing a second current density having a magnitude greater than the limiting current density over said first current density in a second zone, said second current density forming a plurality of dendrites on said metal deposit and said first current density plating an additional metal deposit on said metal foil for firmly bonding said dendrites to said metal foil in said second zone.

4,490,219

METHOD OF MANUFACTURE EMPLOYING ELECTROCHEMICALLY DISPERSED PLATINUM CATALYSTS DEPOSITED ON A SUBSTRATE

Parminder S. Bindra, Ossining, and David N. Light, Putnam Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 7, 1982, Ser. No. 433,328
Int. Cl.³ C25D 5/00, 5/18
U.S. Cl. 204—23 8 Claims



1. A method of forming a catalyst comprising plating a substrate plated with thin, dispersed crystallites of a metal in a system including an anode electrode and a cathode electrode, said method comprising,

applying a nucleation pulse to said cathode electrode, said nucleation pulse having a potential above the nucleation potential of said metal relative to said anode electrode, and said nucleation pulse having a duration on the order of the microsecond range, and then applying a growth pulse having a potential below said nucleation potential for a longer period of time an order of magnitude longer than said nucleation pulse,

to add mass to said crystallites.

4,490,220

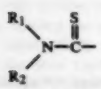
ELECTROLYTIC COPPER PLATING SOLUTIONS

John Houman, Oyster Bay, N.Y., assignor to LeaRonal, Inc., Freeport, N.Y.

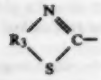
Continuation-in-part of Ser. No. 536,811, Sep. 28, 1983, abandoned, which is a continuation of Ser. No. 429,055, Sep. 30, 1982, abandoned. This application Apr. 27, 1984, Ser. No. 604,917
Int. Cl.³ C25D 3/38
U.S. Cl. 204—52 R 26 Claims

1. An acid copper electroplating solution comprising a soluble copper salt, free acid and a reaction product of

(A) a compound containing a nitrogen-carbon-sulfur-radical of the general structural formula



where R_1 and R_2 are alkyl radicals, a hydrogen atom or mixtures thereof, or



where R_3 is an aromatic, heterocyclic or alicyclic radical or their alkyl derivatives, and

(B) a compound of the formula

$$X—R_1—(S)_n—R_2—Y$$

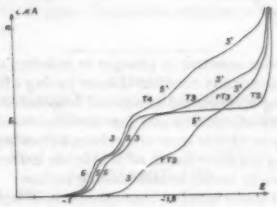
where R_1 and R_2 are the same or different and are substituted or unsubstituted alkylene radicals containing 1 to 6 carbon atoms, X is a functional or non-functional moeity, n is 2, 3, 4, or 5, and Y is a water solubilizing group or a group capable of imparting water solubility to said reaction product, said reaction product being present in a sufficient amount to increase the brightness of the deposit and/or to prevent the formation of cracks during thermal shock.

4,490,221

PROCESS FOR PREPARING IODOTHYRONINES AND IODOTHYROACETIC ACIDS BY ELECTROCHEMICAL REDUCTION AT CONTROLLED POTENTIAL

Edmond Collange, Longvic; Michel Paris, and Nicole Autissier, both of Dijon, all of France, assignors to Spiral Societe a Responsabilite Limitee dite, France

Filed Apr. 28, 1983, Ser. No. 489,536
Claims priority, application France, Apr. 30, 1982, 82 07590
Int. Cl.³ C25B 3/00; C07C 101/72
U.S. Cl. 204—72 16 Claims



1. A process for preparing triiodothyronines, diiodothyronines and monoiodothyronines and triiodothyroacetic acids, diiodothyroacetic acids and monoiodothyroacetic acids containing no iodine in 5-position and/or in 3-position consisting essentially of the steps of forming an electrolyte consisting of an alkaline aqueous solution of a material selected from the class consisting of sodium hydroxide and tetraalkylammonium hydroxide, adding a material selected from the group consisting of thyroxine, triiodothyronine, diiodothyronine, tetraiodothyroacetic acid triiodothyroacetic acid or diiodothyroacetic acid containing iodine in 5-position and/or in 3-position to said solution, subjecting the resulting solution to selective electrochemical reduction at controlled potential of reduction, with respect to an electrode of reference, to effectively eliminate iodine in 5-position and/or iodine in 3-position.

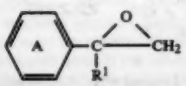
4,490,222

PREPARATION OF SELECTED EPOXIDES

Gwilym R. Davies, Cheshire, and Alfred G. Williams, Berkshire, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 18, 1983, Ser. No. 485,896
Claims priority, application United Kingdom, Apr. 30, 1982, 8212637
Int. Cl.³ C25B 3/02
U.S. Cl. 204—78 10 Claims

1. A process for the production of epoxides of the formula (I):



(I)

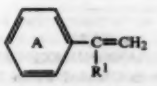
in which the benzene ring A is substituted with 1 to 3 halogen

atoms, which are the same or different, and optionally carries other substituents, and R^1 is

which is the same as or different from the other group

or C_{1-6} alkyl, the process comprising electrolysing the corresponding alkene of the formula (II):

(II)



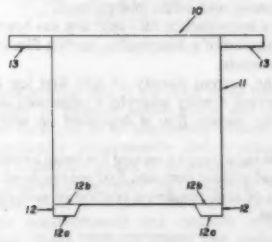
in a medium comprising a solvent for the alkene and an aqueous solution of a halogen salt, the solvent/water ratio by weight being greater than unity, the solvent being miscible with water at the solvent/water ratio used and being chemically inert to both the alkene and the free halogen produced from the halogen salt by the electrolysis.

4,490,223

ELECTRODE FOR ELECTROMETALLURGICAL PROCESSES

William R. Baldwin, Amarillo, Tex., assignor to ASARCO Incorporated, New York, N.Y.

Filed Sep. 21, 1983, Ser. No. 534,441
Int. Cl.³ C25C 1/12; C25B 11/02
U.S. Cl. 204—106 **13 Claims**



1. An electrode for use in electrometallurgical applications comprising

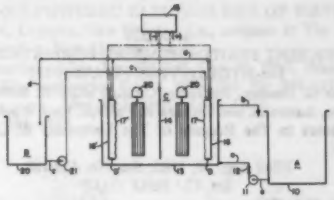
a metal shape having a continuous planar configuration the metal shape having a top, bottom and two vertical sides with two integral, distinct and separate legs extending from the bottom and adjacent to each of said vertical sides, whereby said metal shape when employed as an anode provides uniform electrodeposition of metal onto a cathode sheet.

4,490,224

PROCESS FOR RECONDITIONING A USED AMMONIACAL COPPER ETCHING SOLUTION CONTAINING COPPER SOLUTE

Kevin E. Warheit, Butler, Pa., assignor to Lancy International, Inc., Zelienople, Pa.

Filed Apr. 16, 1984, Ser. No. 600,888
Int. Cl.³ C25C 1/12
U.S. Cl. 204—130 **16 Claims**



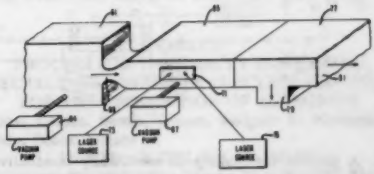
1. A process of recovering copper in slab-like metal form from and of reconditioning a used ammoniacal copper etching solution containing contaminating copper solute for its reuse which comprises, providing an electrolytic cell with a cationic permeable membrane separating it into cathode and anode compartments, providing electrodes for the cell comprising a cathode for the cathod compartment and an anode for the anode compartment, providing and maintaining ammoniacal solutions within the anode and cathod compartments, introducing used ammonium copper etching solution having a contaminating soluble copper solute content into the cathode compartment of the cell, while removing substantially reusable ammonium etching solution therefrom, applying sufficient direct electric and voltage to the electrodes to offset normal electromotive current flow in the cell and effect electroplating-out action on the copper content of the solution, and controlling the application of the electric current and voltage, the pH of the solution in the cathode compartment, and the ammonium ion concentration and pH in the anode compartment to plate-out copper as pure metal in slab-like form on the cathode without forming metal compounds and copper powder in the cathode compartment, and also to substantially retain ammonia and ammonium compound content of the used etching solution as introduced into the cathode compartment.

4,490,225

SEPARATION OF ISOTOPES OF ZIRCONIUM

Edward J. Laboda, Edgewood; Sharon L. Weisberg, Pittsburgh, and Robert W. White, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 7, 1982, Ser. No. 415,094
Int. Cl.³ B01D 59/00
U.S. Cl. 204—158 R **2 Claims**



1. The method of producing zirconium having a low neutron-absorption cross section for use in parts of a nuclear reactor, the said method comprising producing a material of dicyclopentadienyl zirconium dicyanate, $(Cp)_2Zr(OCN)_2$, said material containing a plurality of isotopes of zirconium, subjecting the vapor of said material to radiation emitted from a

carbon-dioxide laser tuned to the vibration of an excitable bond of a selected ^{S}Zr isotope of said material, whereby the ^{S}Zr component of said material is decomposed; separating the product of the decomposition of the ^{S}Zr component from the remainder of said material, and forming the said parts of that one, of the separated ^{S}Zr component of said material or of the remainder of said material, in which the zirconium has the minimum neutron-absorption cross section.

4,490,226

EFFICIENT PHOTOCHEMICAL FORMATION OF 1-α-HYDROXYPREVITAMIN D_3

William G. Dauben, Berkeley, Calif.; Phillip R. Jeffries, Cottesloe, Australia, and Richard B. Phillips, East Windsor, N.J., assignors to The Regents of The University of California, Calif.

Filed Aug. 30, 1982, Ser. No. 413,180
Int. Cl.³ B01J *19/12*
U.S. Cl. 204—159 **6 Claims**

1. In a method for converting a reactant core portion, 5,7-androstadiene-1α,3β-diol, into a product having a product core portion, 9,10-seco-5(10),6,8-androstatriene-1α,3β-diol, said reactant core portion and said product core portion having a group, R, attached at the 17 position, wherein, R, is any group which does not significantly effect the absorption characteristics of said reactant core portion in the range from about 280 nm to about 310 nm, comprising irradiating the reactant with radiation restricted substantially solely to be in the range from about 280 nm to about 310 nm, an improvement which comprises:

maintaining the temperature of the reactant, during the irradiating, below about −20° C.; and

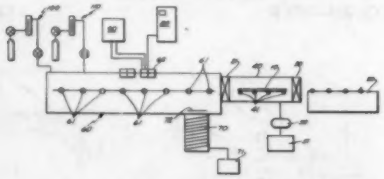
controlling the total dose of radiation to be such that (1) undesirable byproducts are not produced in an amount of more than about 15%, (2) at least about 60% of said product is produced based upon the quantity of the reactant consumed and (3) at least about 40% of the reactant is consumed.

4,490,227

PROCESS FOR MAKING A CURVED, CONDUCTIVELY COATED GLASS MEMBER AND THE PRODUCT THEREOF

Lowell E. Bitter, Holland, Mich., assignor to Donnelly Mirrors, Inc., Holland, Mich.

Filed Nov. 3, 1982, Ser. No. 438,789
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 SP **50 Claims**



1. A process for making an electrically conductive bent substrate which includes coating a generally flat part with indium-tin oxide and subsequently bending same, said process further comprising: providing for at least sufficient oxygen substoichiometry at the moment of bend that the indium-tin oxide coating doesn't craze during bending, but not so great a substoichiometry that the final product has less than 70% light transmission or is hazy.

4,490,228

METHOD OF MANUFACTURING A REFLECTING SURFACE

Claude Bodin, Bracieux, and Alain Gouin, La Chapelle Vendomoise, both of France, assignors to Equipements Automobiles Marchal, Issy-Les-Moulineaux, France

PCT No. PCT/FR82/00105, § 371 Date Feb. 25, 1983, § 102(e) Date Feb. 25, 1983, PCT Pub. No. WO83/00208, PCT Pub. Date Jan. 20, 1983
PCT Filed Jun. 24, 1982, Ser. No. 474,670
Claims priority, application France, Jun. 26, 1982, 81 12658
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 R **19 Claims**

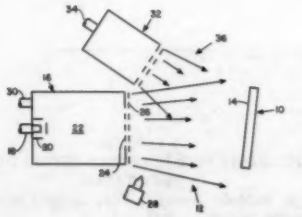
1. A method of forming a heat resistant reflecting metal film on a melted and hardened resin on a substrate comprising, depositing onto said resin a thin layer containing at least one material selected from the group consisting of nickel, nickle-chrome alloys, compounds thereof, and alloys thereof with aluminum, or silicon and compounds thereof, and depositing on said layer a reflective metal film containing a high percentage of aluminum.

4,490,229

DEPOSITION OF DIAMONDLIKE CARBON FILMS

Michael J. Mirtich, North Olmsted; James S. Sovey, Strongsville, and Bruce A. Banks, Olmsted Township, Cuyahoga County, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 9, 1984, Ser. No. 628,866
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 C **19 Claims**



1. A method of making diamondlike carbon films on a substrate comprising the steps of

exposing said substrate to a first ion beam having a first current density and a first energy level,

introducing a hydrocarbon into said first ion beam whereby an initial portion of a diamondlike carbon film is deposited on said substrate,

increasing the current density of said first ion beam to a second current density whereby a remaining portion of a diamondlike carbon film is deposited on said substrate, and

exposing said substrate to a second ion beam having a second energy level greater than said first energy level during the deposition of said remaining portion of said diamondlike carbon film.

4,490,230

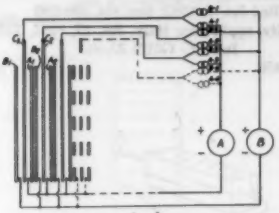
ELECTROPLATING APPARATUS

Ivan M. Fletcher, Carmel, Ind., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Mar. 10, 1983, Ser. No. 474,061
Int. Cl.³ C25D *17/00, 5/18*
U.S. Cl. 204—228 **7 Claims**

1. Electroplating apparatus comprising, a cell for holding electrolyte, a plurality of anodes spaced from each other in said cell, a twice-as-large plurality of cathodes provided in said cell

by articles to be plated and associated with said anodes in pairs wherein the first and second cathode in each pair are disposed in a spaced relation on opposite sides of an anode respective to that pair, first and second direct current sources of which the negative sides of said first and second sources are connected to, respectively, all of said first and second cathodes, a plurality of first current adjusting units respectively corresponding to said



first cathodes and each connected on the positive side of said first source between said first source and the anode respective to said first cathode corresponding to that first unit, and a plurality of second current adjusting units respectively corresponding to said second cathodes and each connected on the positive side of said second source between said second source and the anode respective to said second cathode corresponding to that second unit.

4,490,231

ELECTROLYTIC CELL OF THE FILTER PRESS TYPE

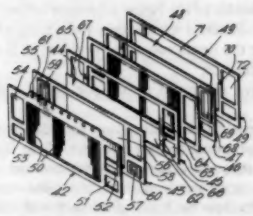
Thomas W. Boulton, Cheshire, England, assignor to Imperial Chemical Industries PLC, Hertfordshire, England

Filed Nov. 12, 1982, Ser. No. 440,854

Claims priority, application United Kingdom, Nov. 24, 1981, 8135403

Int. Cl.³ C25B 9/00

U.S. Cl. 204—263 **10 Claims**



1. An electrolytic cell of the filter press type comprising

a plurality of metallic anode plates and metallic cathode plates arranged in an alternating manner, a substantially hydrualically impermeable cation-exchange membrane and a frame-like gasket of an electrically insulating material positioned between each adjacent anode plate and cathode plate to form in the cell a plurality of separate anode compartments and cathode compartments, the anodes plates, cathode plates and gaskets having four opening therein which in the cell together define four separate compartments lengthwise of the cell from which liquors may be charged respectively to the anode and cathode compartments of the cell and through which the products of electrolysis may be removed respectively from the anode and cathode compartments of the cell,

characterised in that, in order to electrically insulate those comartments lengthwise of the cell from which liquors are charged to and through which products of electrolysis are removed from the anode compartments of the cell from those compartments lengthwise of the cell from which liquors are charged to and through which products of electrolysis are removed from the cathode compartments of the cell, there are positioned within and around the peripheries of at least some of the openings in the metallic anodes plates and cathode plates frame-like members of an electrically insulating material, said frame-like members being positioned on and being upstanding from the surface of said gasket.

4,490,232

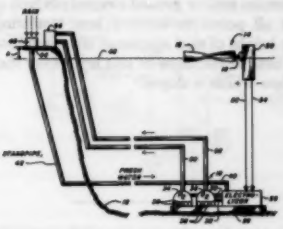
WAVE-POWERED ELECTROLYSIS OF WATER

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation of Ser. No. 316,502, Oct. 29, 1981, abandoned. This application Feb. 1, 1984, Ser. No. 591,222

Int. Cl.³ C25B 15/00, 1/02

U.S. Cl. 204—278 **7 Claims**



1. A system for the offshore generating of pressurized gas from wave power comprising:

a fresh water subsea electrolyzer;

wave-powered means for directly providing electric power to said subsea electrolyzer and not to any fresh water pumping system, such that maximum use is made of the wave power to electric power conversion;

a source of fresh water sufficiently above the sea surface to provide the required pressure at the subsea electrolyzer for proper operation thereof, said source being coupled to said subsea electrolyzer;

a subsea storage vessel having a bottom aperture adapted to admit sea water;

an inlet conduit from said electrolyzer to the interior of said vessel;

an outlet conduit from said vessel to an onshore location, said outlet conduit having an end positioned in said vessel, whereby pure gas under the pressure determined by the depth of said storage vessel is delivered onshore; and

a water-filled standpipe between said source of fresh water and said subsea electrolyzer, said fresh water source including a reservoir of fresh water at a height above the sea surface sufficient to drive the fresh water to said subsea elecrolyzer without pumping such that no pump is used in the fresh water supply for said subsea electrolyzer.

4,490,233

PROCESS FOR THERMALLY INSULATING PRECALCINED ANODES IN ELECTROLYSIS CELLS FOR THE PRODUCTION OF ALUMINUM

Spyridon Casdas, Beotie, Greece, assignor to Aluminium de Grece, Beotie, Greece

Filed May 2, 1983, Ser. No. 490,878

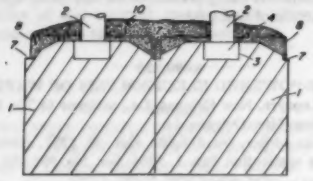
Claims priority, application France, May 18, 1982, 82 08978

Int. Cl.³ C25C 3/12

U.S. Cl. 204—290 R **5 Claims**

1. A process for thermally insulating a precalcined anode in a cell for the production of aluminum by the electrolysis of alumina dissolved in an electrolysis bath based on molten cryolite, the edges of the top surface of said anode being sloped downwardly to join the side walls of said anode at its upper

periphery, comprising (1) applying to said anode from a point adjacent the juncture of the sloped portion and side walls, and over its entire upper periphery, a strip of aluminum extending upwardly, and (2) covering the top-surface of said anode with



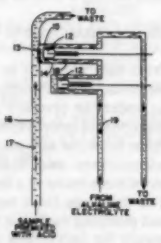
a layer of alumina and/or ground electrolysis bath of sufficient thickness at all points to serve a heat insulating function, wherein the height of said aluminum strip is substantially the same as the desired thickness of said layer over the portion of the top surface which is sloped.

4,490,234

METHOD FOR MEASURING IONIC CONCENTRATION UTILIZING AN ION-SENSING ELECTRODE

Edmund E. Buzza, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 22, 1982, Ser. No. 350,696
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—409 **5 Claims**



1. A method for measuring the concentration of a substance in a sample liquid, said method utilizing an ion-sensing electrode including a permeable membrane spaced from said electrode, said space between said membrane and said electrode containing an electrolyte solution, said method comprising the steps of:

premixing the sample liquid with a reagent to release said substance prior to contact with the permeable membrane;

contacting said permeable membrane with said sample liquid;

circulating said electrolyte solution through said space at a rate greater than said substance diffuses through said membrane;

stopping said circulating electrolyte solution; and

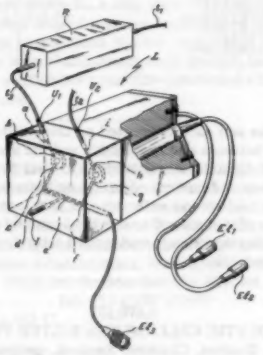
measuring said concentration.

4,490,235

ELECTROCHEMICAL CELL PROVIDED WITH SELECTIVE ELECTRODES AND AT LEAST ONE CHEMICAL REACTOR, FOR INDIRECT MEASUREMENT OF CLINICAL-CHEMICAL PARAMETERS

Claudio Calzi, 8 Via Popoli Uniti, Milan, Italy 20125, assignor to Claudio Calzi, Milan, Italy

Filed Jul. 7, 1982, Ser. No. 396,090
Claims priority, application Italy, Jul. 13, 1981, 22887 A/81
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—409 **10 Claims**



1. An electrochemical cell for indirect measurement of clinical-chemical parameters of a liquid substance, comprising:

a chemical reactor;

a first selective electrode means for measuring a clinical-chemical parameter of the liquid substance before the flow of the liquid substance enters into the chemical reactor and again after the liquid substance reverses its flow out of the chemical reactor;

a second selective electrode means for being a reference electrode;

two distinct internal fluidic path means for allowing passage of the liquid substance so that one part of the liquid substance passes through a first path into contact with the measuring electrode means and the chemical reactor and then reverses its flow back out of contact with the chemical reactor and the measuring electrode means, and another part of the liquid substance passes through a second path into contact with just the reference electrode means;

a single tube means for inputting the liquid substance to be measured into the two fluidic path means and for outputting the liquid substance from the two fluidic path means after measurement, said single tube means having two outputs connected to the two fluidic path means; and

motor means for reversing flow of the liquid substance in the chemical reactor;

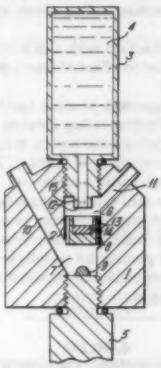
whereby two consecutive measurements are carried out on the liquid substance, first, when the liquid substance initially comes into contact with the measuring electrode means, the chemical reactor, and the reference electrode means, and, second, on just part of the liquid substance which has reacted in the chemical reactor when that part of the liquid substance has reversed its flow back into contact with the measuring electrode means, so that the clinical-chemical parameter of the liquid substance can be measured.

4,490,236

METHOD AND MEANS FOR ELECTRODE CALIBRATION

John D. Petty, 34 Palm Ave., Holland Park, Queensland, Australia

Filed Apr. 27, 1983, Ser. No. 489,150
Claims priority, application Australia, Apr. 30, 1982, 83153/82
Int. Cl.³ G01N 27/28
U.S. Cl. 204—409 22 Claims



1. Apparatus for calibrating a tipped sensing electrode used to measure the quantity of a particular substance in a flowing test solution comprising:

a cell body enclosing a cavity having an upper portion and a lower portion;

a reservoir for a calibration solution removably positioned above said cell body;

a reservoir conduit means for flowingly connecting said reservoir to said cavity upper portion;

aperture means in said cavity lower portion adapted to removably receive the tip of said sensing electrode;

first conduit means for permitting a test solution to flowingly enter said cavity;

second conduit means for permitting said test solution to flowingly exit said cavity; and

valve means entirely located within said cavity and powered solely by the flow of said test solution, for closing said reservoir conduit means when said test solution flows through said cavity and opening said reservoir conduit means when said test solution ceases flowing through said cavity; so that calibration solution may automatically be afforded to said sensing electrode tip upon termination of test solution flow.

19. A method of calibrating an electrode comprising directing a test solution past said electrode, and opening a closure to a source of calibrating solution which contacts said electrode when said test solution is not flowing past said electrode, the opening of said closure being activated by the absence of test solution flow past said electrode.

4,490,237

PROCESS FOR RECOVERING HEAT FROM THE COMBUSTION OF RESIDUAL CARBON IN OIL DEPLETED SHALE

Louis H. Jaquay, Upper St. Clair, Pa., and Albert C. Mengon, deceased, late of Beaver, Pa. (by Mary A. Mengon, administratrix), assignors to Dravo Corporation, Pittsburgh, Pa.

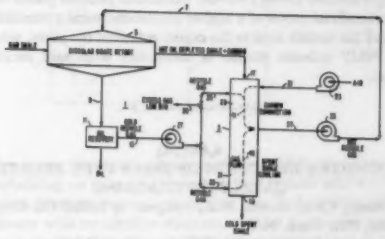
Filed Jul. 1, 1983, Ser. No. 510,289
Int. Cl.³ C10G 1/02; C10B 51/00, 49/06
U.S. Cl. 208—11 R 8 Claims

1. A process for the combustion of the residual carbon in hot oil depleted shale from which the oil has been recovered through indirect retorting with hot recycle gas, and for recovering the heat generated thereby, said process comprising the steps of:

charging the hot oil depleted shale into the top of a vertical shaft furnace for descending passage therethrough;

feeding an oxygen containing gas into the upper portion of the vertical shaft furnace for downward flow concurrent with the hot oil depleted shale to effect combustion of the residual carbon therein resulting in the generation of combustion gases and hot spent shale;

introducing a cool, inert gas into the upper portion of said vertical shaft furnace for downward flow with the oxygen containing gas and the hot oil depleted shale to control the temperature of combustion of the residual carbon in the



hot oil depleted shale and wherein said cool, inert gas is introduced into the upper portion of said vertical shaft furnace at a point below the level at which the oxygen containing gas is fed into the furnace such that ignition of the residual carbon in the hot oil depleted shale is not inhibited;

introducing additional cool, inert gas into the bottom portion of the vertical shaft furnace for upward flow countercurrent to the downward flow of the hot spent shale to cool and transfer the heat therein to said inert gas; and

withdrawing the downward flowing inert gas and combustion gases and the upward flowing additional inert gas intermediate the upper and lower portions of said vertical shaft furnace.

4,490,238

PROCESS FOR BENEFICIATING OIL-SHALE

Michael Siskin, Livingston, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 16, 1984, Ser. No. 600,433
Int. Cl.³ C10G 1/04
U.S. Cl. 208—11 LE 6 Claims

1. A process for removing mineral matter from oil-shale which process comprises contacting the oil-shale with an ammonium salt solution at a temperature from about 0° C. to about 300° C. for at least a period of time which is sufficient to remove at least about 80 wt.% of the carbonate mineral matter from the oil-shale.

4,490,239

PITCH FOR CARBON FIBERS

Seiichi Uemura, Tokyo; Shunichi Yamamoto; Takao Hirose, both of Kamakura; Hiroaki Takashima, Kawasaki, and Osamu Kato, Yokohama, all of Japan, assignors to Nippon Oil Company, Limited, Japan

Filed Mar. 22, 1983, Ser. No. 477,683
Claims priority, application Japan, Mar. 29, 1982, 57-49003
Int. Cl.³ C10C 3/00; D01F 9/12, 9/20
U.S. Cl. 208—44 5 Claims

1. A process for preparing a pitch for carbon fibers comprising, heat treating a carbonaceous pitch to form a content of 5 to 35 weight percent of an optically anisotropic region and

adding into said pitch 0.5 to 10 weight percent of sulfur at a temperature of 150° to 400° C.

4,490,240

REMOVAL OF CORRODANTS FROM NMP SOLVENT BY CONTACTING WITH SACRIFICIAL METAL

Roy V. Comeaux, Baytown, Tex.; Milton D. Leighton, Florham Park, and Douglas G. Ryan, Rockaway, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 29, 1983, Ser. No. 527,241
Int. Cl.³ C10G *29/04, 1/04*
U.S. Cl. 208—47 4 Claims

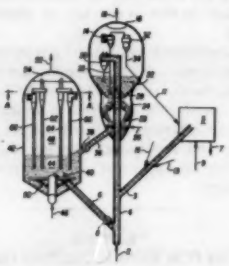
1. A method for arresting the corrosion in selective N-methyl-pyrrolidone (NMP) solvent extraction process plants by use of a sacrificial metal of a higher electrochemical potential than that of the metals used in the construction of the plant, wherein the NMP solvent stream is contacted with said sacrificial metal.

4,490,241

SECONDARY INJECTION OF ZSM-5 TYPE ZEOLITE IN CATALYTIC CRACKING

Tai-Sheng Chou, Sewell, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 26, 1983, Ser. No. 488,860
Int. Cl.³ C10G *51/04*
U.S. Cl. 208—75 11 Claims



1. In a catalytic cracking process comprising cracking a hydrocarbonaceous feed in a riser reactor in the presence of a catalyst comprised of a mixture of a conventional cracking catalyst and a ZSM-5 type zeolite additive catalyst serving to increase octane number and overall yield of said process, the improvement whereby deactivation of said addition catalyst is minimized which comprises introducing the ZSM-5 type zeolite additive catalyst having a particle size of about 20 to 40 microns at a point which is at least 5% of the total riser reactor length downstream from the point of introduction of the hydrocarbonaceous feed, wherein the resulting mixture of the hydrocarbonaceous feed and catalyst proceeds through the riser reactor to a downstream reactor separation means wherein a first process stream comprising the ZSM-5 type catalyst and conventional cracking catalyst fines is separated from a second process stream comprising the conventional cracking catalyst; and wherein said second process stream is conducted to a first regenerator vessel operating at a temperature of at least about 1250° F. wherein the conventional cracking catalyst is regenerated by an oxygen-containing gas, and said first process stream is conducted to a second regenerator vessel operating at a temperature no greater than about 1200° F.

4,490,242

TWO-STAGE HYDROCARBON DEWAXING HYDROTREATING PROCESS

Stephen M. Oleck, Moorestown, and Robert C. Wilson, Jr., Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 417,765, Sep. 13, 1982, Pat. No. 4,437,976, which is a division of Ser. No. 290,759, Aug. 7, 1981,. This application Jan. 13, 1984, Ser. No. 579,317
Int. Cl.³ C10G *65/02, 45/12*
U.S. Cl. 208—97 10 Claims

1. A process for catalytically dewaxing and hydrotreating a waxy hydrocarbon fraction boiling above approximately 850° F. which comprises:

(a) contacting said fraction with a dewaxing catalyst under conditions sufficient to effect at least a partial dewaxing of said fraction; and

(b) contacting the reaction product thereby obtained with hydrogen and a hydrotreating catalyst comprising a hydrogenation component and one or more zeolites selected from the group consisting of ZSM-5, ZSM-11, ZSM-23, and ZSM-35 blended with a refractory inorganic oxide to form an extrudate, said extrudate having a metal hydrogenation component present therein in a concentration of metal in elemental oxide, or sulfide form of between about 0.05 and about 25 percent by weight and a concentration of zeolite in said extrudate of between about 5 and about 40 percent by weight.

4,490,243

PROCESS FOR THERMAL CRACKING OF HEAVY PETROLEUM OILS

Terukatsu Miyauchi, Yokohama; Yoneichi Ikeda, Kamakura, and Tatsuji Kikuchi, Tokyo, all of Japan, assignors to Terukatsu Miyauchi, Yokohama, Japan

Continuation of Ser. No. 279,762, Jul. 2, 1981, abandoned. This application Jun. 15, 1983, Ser. No. 504,385
Claims priority, application Japan, Jul. 9, 1980, 55-92664
Int. Cl.³ C10G *9/32, 25/09*
U.S. Cl. 208—127 6 Claims

1. A process for obtaining principally light petroleum oils comprising thermally cracking a heavy petroleum oil by causing the heavy petroleum oil to contact a fluidized bed of heated solid particles in the presence of steam, wherein the solid particles consist essentially of non-catalytic particles that are stable at the temperature of the thermal cracking, are porous with a pore volume of 0.10 to 1.5 cm^3/g, have a specific surface area of 50 to 1500 m^2/g, have weight-mean diameters of 0.025 to 0.25 mm, and have substantially spherical shape.

4,490,244

PRODUCTION OF PREMIUM GRADE PETROLEUM COKE

Glenroy Stecker, Johnson City, Tenn., assignor to Great Lakes Carbon Corporation, New York, N.Y.

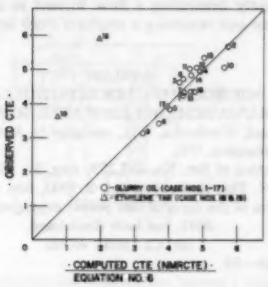
Continuation-in-part of Ser. No. 427,706, Sep. 29, 1982, abandoned. This application Sep. 21, 1983, Ser. No. 534,489
Int. Cl.³ C10G *9/14*
U.S. Cl. 208—131 7 Claims

1. In a process for the selection of a feedstock or blend of feedstocks selected from the group consisting of catalytic slurry oils and ethylene pyrolysis tars to be coked in a delayed coker for the production of a premium needle coke having a graphite CTE characteristic of not more than 5×10^{-7} cm/cm/°C. over the range of 0° to 50° C. from petroleum-based coker feedstock, the improvement comprising the steps of:

(1) Performing an analysis by high resolution nuclear magnetic spectroscopy on said feedstock to determine the values for the bands AR1, AR2, AL1, AL2, and AL3 as a percentage wherein AR1 denotes aromatic hydrogen atoms of the polycyclic type, primarily "bay protons,"

AR2 denotes aromatic hydrogens of the benzenoid type, AL1 denotes aliphatic hydrogens of the benzylic type, AL2 denotes aliphatic hydrogens of the methylene type, and AL3 denotes aliphatic hydrogens of the methyl type, respectively, wherein the total of said AR1, AR2, AL1, AL2 and AL3 percentages is 100%;

(2) Selecting said feedstock or blend of said feedstocks to have a coked product CTE of not more than 5×10^{-7} cm/cm/°C. as predicted by an equation derived by multiple linear regression analysis of the said values as independent variables for a statistically significant number of said



feedstocks independently determined by laboratory coking to produce said premium needle cokes when coked in a delayed coker, said equation being in the form of CTE=K+NMR, where CTE is the coefficient of thermal expansion of the coked product, K is a constant, NMR is defined as value given by the equation expressing any four of the said values for AR1, AR2, AL1, AL2, and AL3 as determined by NMR and expressed by the equation in the form $NMR=b_1x_1+b_2x_2+b_3x_3+b_4x_4$, where b_{1-4} are the coefficients of any four of the individual bands for hydrogen AR1, AR2, AL1, AL2, and AL3, and x_{1-4} are the same four values of the said NMR bands.

4,490,245

PROCESS FOR RECLAIMING USED LUBRICATING OIL

Theodore C. Mead, Port Neches, and James H. Wright, Houston, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 9, 1984, Ser. No. 598,100
Int. Cl.³ C10M *11/00*
U.S. Cl. 208—179 **10 Claims**

6. A process for reclaiming a used lubricating oil characterized by containing metal-containing compounds, sludge or other undesirable components or mixtures thereof to produce as major products a lubricating oil base stock suitable for blending and a solid, coked, metal-containing residue suitable for landfilling, the process comprising the steps of:

(a) vacuum distilling the used lubricating oil at 0.1 to 20 mm Hg flash zone pressure and up to 650° F. flash zone temperature to produce a lighter key boiling between 650° F. and 1050° F. and a bottoms key;

(b) catalytically hydrogenating the lighter key at a pressure of 200 psia to 1600 psia, 400° F. to 700° F. and liquid hourly space velocity of 0.4 to 2.0 to produce the lubricating oil base stock of ASTM color less than 5;

(c) admixing limestone with the bottoms key in a ratio of 2:1 to 0.5:1 (wt:wt);

(d) vacuum pyrolyzing the admixture at a temperature of 1000° F. to 1200° F. and pressure of 0.1 to 5 mm Hg while drawing off vaporizable components until the solid coked, metal-containing residue remains;

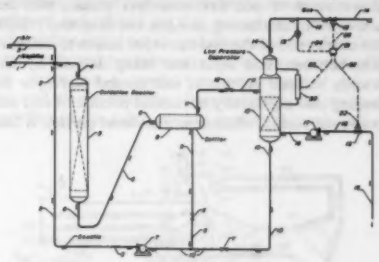
(e) condensing the vaporizable components and drawing off a non condensible vapor of fuel gas quality.

4,490,246

PROCESS FOR SWEETENING PETROLEUM FRACTIONS

Thomas A. Verachtert, Wheeling, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 18, 1983, Ser. No. 553,344
Int. Cl.³ C10G *19/02, 19/08*
U.S. Cl. 208—206 **16 Claims**



1. A process for treating hydrocarbons which comprises:

(a) admixing air into a hydrocarbon feed stream which comprises mercaptans and contacting the hydrocarbon feed stream with an alkaline aqueous solution and a mercaptan oxidation catalyst in an oxidation zone maintained at oxidation-promoting conditions which include an elevated pressure above about 120 psig, and forming a liquid phase oxidation zone effluent stream which comprises hydrocarbons, disulfide compounds and an alkaline aqueous solution with oxygen and nitrogen being dissolved in the hydrocarbons;

(b) separating the oxidation zone effluent stream in a high pressure separation zone separate and remote from said oxidation zone and which is maintained at essentially the same pressure of above about 120 psig as the oxidation zone into a liquid phase first process stream which comprises hydrocarbons having disulfide compounds, oxygen and nitrogen dissolved therein and an aqueous stream comprising the alkaline solution;

(c) withdrawing the aqueous stream from the high pressure separation zone;

(d) passing the first process stream into a low pressure separation zone operated at a pressure below about 5 psig, to form a vapor stream comprising oxygen, nitrogen and vaporous hydrocarbons and a liquid phase second process stream which comprises liquid hydrocarbons having disulfide compounds dissolved therein; and,

(e) passing the second process stream into a low pressure storage facility.

4,490,247

AIR STREAM SEPARATOR

Lennart G. K. Forsberg, Carl Gustafs väg 19, S-217 42 Malmö, and Per-Ingvar Moberg, Solvägen 4G, 873 00 Bollstabruk, both of Sweden

PCT No. PCT/SE82/00023, § 371 Date Aug. 12, 1982, § 102(e) Date Aug. 12, 1982, PCT Pub. No. WO82/02503, PCT Pub. Date Aug. 5, 1982
PCT Filed Jan. 28, 1982, Ser. No. 414,350
Claims priority, application Sweden, Jan. 29, 1981, 8100637
Int. Cl.³ B07B *7/00*
U.S. Cl. 209—20 **13 Claims**

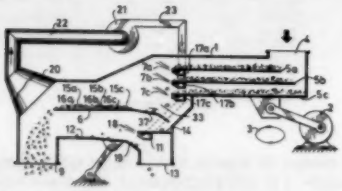
1. An air stream separator for separating a heavier fraction, such as stone, from a mixture including lighter materials having different properties, such as chips, comprising:

A. a first elongate vibrating conveyor means vibrating through planes parallel to the longitudinal direction thereof to convey material forwardly and downstream in

said direction, said first conveyor means having an output end;

B. means for generating an air stream comprising an air nozzle located at the output end of said first conveyor means, said nozzle positioned and arranged to direct said air stream upward and forward with respect to said conveying direction;

C. a second elongate vibrating conveyor means positioned downstream of said first conveyor means, said second conveyor means having an input end in spaced relation to the output end of the first conveyor means to define a gap therebetween, said input end being defined by an upwardly inclined portion of said second conveyor means leading into a generally horizontal portion of said second conveyor means, wherein said inclined portion is located



to receive said heavier fraction of said material dropping from said output end of said first conveyor means in order to rearwardly convey said heavier fraction in descent along said inclined portion and separated from said lighter particles impelled by said air stream onto said second conveyor means for forward conveyance thereon, said second conveyor means being of a length whereby the air stream impelled particles are received on an intermediate portion thereof, said second conveyor means including an output end remote from the input end, said second conveyor means comprising means for conveying said received particles to the output end of the second conveyor means and mixing said received particles during conveyance thereof;

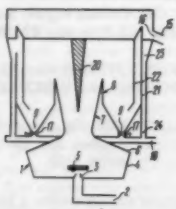
D. means for vibrating said first and second conveyor means.

4,490,248

METHOD AND FLOTATION MACHINE FOR CONCENTRATING ORES OF NON-FERROUS METALS

Jury M. Filippov, ulitsa Derzhavina, 19, kv. 7, and Gely R. Bochkarev, Krasny prospekt, 56, kv. 26, both of Novosibirsk, U.S.S.R.

Filed Jul. 6, 1982, Ser. No. 395,841
Int. Cl.³ B03D 1/02, 1/24
U.S. Cl. 209—164 **12 Claims**



1. A method for concentrating ores of non-ferrous metals by flotation, comprising the steps of

mixing a pulp with air for forming a pulp and air mixture,

feeding said mixture under pressure through a nozzle to the bottom part of a vertical mixing chamber,

directing said pulp and air mixture toward an impact wall provided in said mixing chamber and disposed directly adjacent to said nozzle to form a plurality of pulp and air flows containing individual air bubbles of a diameter not exceeding 150–200 μm when said pulp and air mixtures hits said wall,

directing the flows resulting from the impact against said wall toward one another to cause collision of said respective flows in a top part of said mixing chamber at a velocity of 90–100 cm/s and at an angle of 40°–75° with respect to a vertical axis of said mixing chamber, and

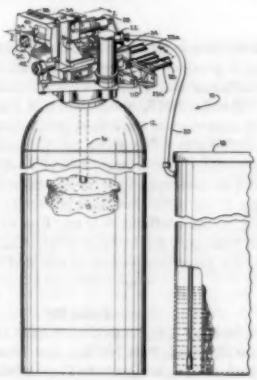
subsequently deaerating a flow formed as a result of the collision and removing a resultant froth layer.

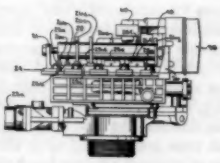
4,490,249

MICROCOMPUTER CONTROLLED DEMAND/SCHEDULED WATER SOFTENER

J. David Seal, Waukesha, Wis., assignor to Autotrol Corporation, Milwaukee, Wis.

Continuation of Ser. No. 412,279, Aug. 27, 1982, Pat. No. 4,426,294. This application Jul. 8, 1983, Ser. No. 511,876
The portion of the term of this patent subsequent to Jan. 17, 2001, has been disclaimed.
Int. Cl.³ B01J 49/00
U.S. Cl. 210—89 **7 Claims**





1. A control for a water treatment device having a particle bed comprising:

a flow meter for measuring the amount of treated water leaving the water treatment device;

a data input device for entering data indicative of the total treating capacity of the water treatment device; and

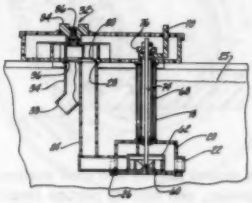
a controller coupled to said flow meter and to said data input device for determining the remaining particle bed treating capacity in accordance with a prescribed relationship between the amount of treated water leaving the softener since the last regeneration and total particle bed treating capacity, said controller setting a treated water reserve

representing the anticipated treated water usage and dynamically updating said reserve value each day, and said control initiating regeneration at a set time each day if said treated water reserve exceeds said remaining particle bed treating capacity.

4,490,250
AQUARIUM FILTERING SYSTEM

Denzel J. Dockery, Ponce De Leon, Fla., assignor to Vortex Innerspace Products, Ponce De Leon, Fla.

Filed Mar. 13, 1984, Ser. No. 589,022
Int. Cl.³ E04H *3/20*; B01D *35/02*
U.S. Cl. 210—169 **6 Claims**



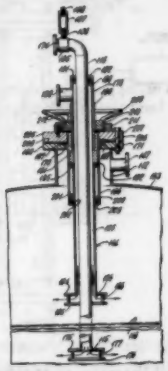
1. A filtering system for an aquarium having a tank in which water is contained comprising:
- a filter having an inlet and an outlet,
- a pump having a first port and second pump port being open to said aquarium,
- a valve assembly having two ports,
- means for selectively fluidly connecting either of said valve ports to said filter inlet and the other of said valve ports to said filter outlet,
- means for fluidly connecting one of said valve ports to said aquarium tank,
- means for fluidly connecting the other of said valve ports to said first pump port,
- means for selectively pumping water from either of said pump ports and toward the other of said pump ports.

4,490,251
APPARATUS FOR RECOVERY OF WATER FROM DISPERSIONS OF SOOT AND WATER

Manuel E. Quintana, Yonkers, N.Y., and Lawrence E. Estabrook, Whittier, Calif., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Jan. 24, 1983, Ser. No. 460,411
Int. Cl.³ B01D *21/10, 21/24*
U.S. Cl. 210—209 **10 Claims**

1. An apparatus for continuously separating by gravity a liquid feed stream comprising a mixture of soot, water and liquid organic extractant into a clarified water layer and a separate dispersion of soot and liquid organic extractant, which dispersion floats on said clarified water layer at the interface level, and from which apparatus separate streams of said clarified water and dispersion are simultaneously and continuously removed comprising: a closed vessel having a substantially circular horizontal cross-section and a vertical central axis, said vessel being substantially filled with fluid, a flanged upper central axial port in the top of said vessel, a side exit port in communication with said upper central port through which said liquid dispersion of soot and extractant is discharged, an exit port in the lower portion of said vessel through which said clarified water is simultaneously discharged, inner vertical coaxial conduit means entering the vessel by way of said upper central port and passing vertically down the vertical central axis of the vessel, support means for said inner conduit means, inlet means connected to said inner conduit means near its upstream end for introducing said liquid feedstream, outer vertical coaxial conduit means entering the vessel by way of said upper central port and concentric with said inner conduit and spaced therefrom to provide an annular passage conduit means connected to said annular passage near its upstream end for introducing said liquid organic extractant, a coaxial concentric horizontally disposed first radial nozzle in communication with the downstream end of said inner conduit means for simultaneously and continuously distributing said liquid feed stream below said interface level, a coaxial concentric horizontally disposed second radial nozzle in communication with the downstream end of said annular passage at a position above that of said first radial nozzle and above said interface level for simultaneously and continuously distributing a stream of liquid organic extractant a coaxial concentric vertical cylindrical sleeve, said sleeve extending longitudinally and surrounding that portion of the outer conduit passing through said upper



central port, first sealing and spacing means at the downstream end of said sleeve between the inside surface of said sleeve and the outside surface of said outer conduit for providing an annular space with a liquid-tight seal while permitting longitudinal movement of the outer conduit vertically up or down within said sleeve, and second sealing and spacing means at the upstream end of said outer conduit between said inner and outer conduits for providing said annular passage with a liquid-tight seal at the upstream end while permitting longitudinal movement of the outer conduit up or down, a gasketed top horizontal ring flange that holds said vertical sleeve in place and which is attached to the flange of said upper central axial port; and adjusting means for moving said outer conduit and second radial nozzle vertically up or down with respect to said interface level.

4,490,252
ELECTROSTATIC SCALE CONTROL APPARATUS FOR FEED WATER HAVING ROTATING HELIX RESPONSIVE TO WATER FLOW RATE

Miguel F. Brigante, Calle el Retiro Quinta Caney el Rosal, Caracas, Venezuela

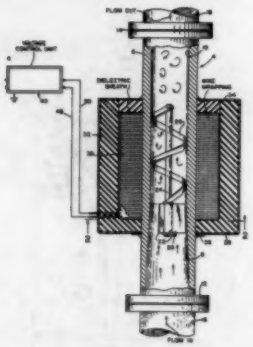
Continuation of Ser. No. 672,819, Apr. 1, 1976, abandoned. This application Jan. 23, 1981, Ser. No. 227,930
Int. Cl.³ B01D *35/06*
U.S. Cl. 210—222 **1 Claim**

1. A magnetic apparatus for treating feed water in a boiler feed water inlet tube subject to scale, comprising:
- an electromagnetic coil formed of an electrical winding energized by DC voltage surrounding said inlet tube creating magnetic forces within the tube;
- an elongated impeller consisting of a helical band formed of ferromagnetic material, a central rotatable shaft supporting said band about which said band extends along the length thereof and a stationary finned bearing at the rear

of said shaft supporting said shaft for rotating movement which orients said helical band and shaft along the direction of water flow from the rear of the bearing to the tip of the shaft and band whereby said band and shaft rotate in said bearing in response to straight through flow of water through said inlet tube into the boiler;

said helical band having a diameter which is only slightly narrower than the inner diameter of said inlet tube to fit closely in proximity to the inner surface of said tube thereby directing in-flowing water tangentially in a swirling motion from said band to the inner surface of said tube as a result of water flow through said tube;

tapered means in said tube which extend approximately the length of said shaft and said helical band having a widened inner portion at the rear of said impeller in said tube whose



width is about the width of said finned bearing but said finned bearing being wider than the tapered portion whereby said impeller is locked at the finned bearing in a rear location of the tapered bearing so that water flowing in said tube is directed toward said helical band at the front of the impeller to lock the impeller where the taper position narrows; and

a D.C. energy source consisting of an A.C. to D.C. converter which converts 110 to 220 volts A.C. to 20 volts D.C. energizing said electrical winding to generate magnetic lines of force within the electromagnetic coil surrounding said tube, said magnetic lines of force acting simultaneously with the swirling movement of the feed water imparted by rotation of the ferromagnetic helical band on the shaft.

4,490,253

FILTER BAG WITH REMOVABLE RING AND HANDLE AND METHOD OF ASSEMBLY THEREFOR

Peter T. Tafara, 4803 Spring St., Neptune, N.J. 07753

Filed Apr. 14, 1983, Ser. No. 485,001

Int. Cl.³ B01D *29/14*

U.S. Cl. 210—238 **12 Claims**

1. A filter bag assembly suitable for use in high pressure filter housings for filtering liquids that pass therethrough, comprising:

(A) a tubular filter bag having one closed end and one open end;

(B) a first ring having a generally rectangularly-shaped cross-section; and

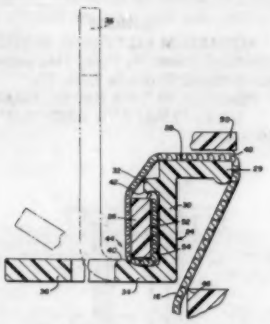
(C) a second ring, said second ring in cross-section having;

(i) a generally flat top portion with an externally extending lip portion, said externally extending lip portion being adapted to rest upon an inwardly extending portion provided in said filter housing sandwiching said filter bag therebetween;

(ii) a depending vertical portion disposed beneath said flat top portion, said vertically depending portion having an inwardly extending shelf portion disposed proximate said flat top portion, and

(iii) a generally horizontal inwardly extending lip portion terminating said vertically depending portion;

said first ring being adapted to be received within the channel



formed in said second ring by said shelf portion, said depending vertical portion, and said lip portion retaining said filter bag therebetween.

2. A filter bag assembly according to claim 1 further including an integrally formed inwardly extending handle disposed on the inwardly extending lip portion of said second ring.

4,490,254

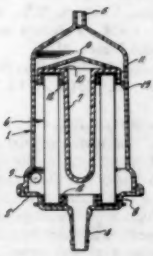
BLOOD FILTER

Lucas S. Gordon, San Juan Capistrano, and Karl M. Sutherland, Westminster, both of Calif., assignors to Bentley Laboratories, Inc., Irvine, Calif.

Filed Feb. 25, 1980, Ser. No. 124,312

Int. Cl.³ B01D *35/00, 19/02*

U.S. Cl. 210—247 **8 Claims**



1. Blood filter assembly comprising:

a. a shell having a first top end and a second bottom end,

b. a blood inlet located in the region of said bottom end and opening into said bottom end,

c. a blood outlet located in the region of said bottom end,

d. a gas vent located in the region of said top end, and

e. a blood filter medium located between said blood inlet and said blood outlet,

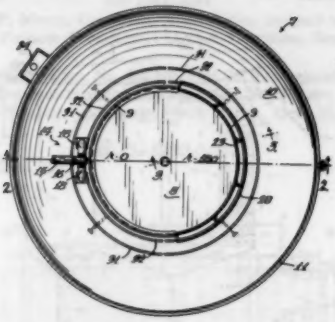
said blood inlet being located and configured in a manner capable of directing incoming blood in a generally spiral path within said shell.

4,490,255

COMBINED SETTLING AND LIQUID STORAGE TANK

Robert W. Johnson, Mount Prospect, Ill., assignor to United Conveyor Corporation, Deerfield, Ill.

Filed Jan. 12, 1983, Ser. No. 457,465
Int. Cl.³ B01D 21/00
U.S. Cl. 210—256 19 Claims



1. A combined settling and liquid storage tank comprising, in combination:

an inner cylindrical storage tank having a circumferential wall of larger diameter and depth;

an outer annular settling tank concentrically surrounding said storage tank, said settling tank having a ratio of width to internal circumference which produces essentially plug flow;

an infeed for introducing at very low velocity into the uppermost part of body of liquid in said outer annular settling tank a feed liquid containing suspended fine particles which may settle out of said feed liquid, said infeed occupying a small area in the vicinity of a line segment defining a zero radius of the settling tank;

an overflow weir over which outflow liquid may pass at very low velocity from the upper part of said body of liquid directly into said inner storage tank, said weir surrounding

no more than about half the circumference of the inner storage tank and being bisected by a line segment defining a 180° radius of the outer annular settling tank, and said weir comprising a flow metering plate which concentric with the inner storage tank circumferential wall;

means for removing settled particles from the lower portion of the outer annular settling tank; and

means for removing liquid from said inner storage tank.

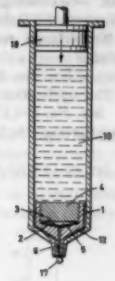
4,490,256

APPARATUS FOR STATIC MEMBRANE FILTRATION

Dietmar Nussbaumer; Horst Perl, and Khuong T. Vinh, all of Göttingen, Fed. Rep. of Germany, assignors to Sartorius GmbH, Göttingen, Fed. Rep. of Germany

Filed Nov. 25, 1983, Ser. No. 554,995
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243862
Int. Cl.³ B01D 33/00
U.S. Cl. 210—359 11 Claims

1. Apparatus for static membrane filtration, including a cylindrical sample vessel containing a filtration medium and subjected to centrifugal acceleration, the apparatus comprising a plunger mounted in sealed manner in the sample vessel and being movable therein, and an asymmetrical membrane attached to said plunger at an end thereof facing the bottom of the sample vessel, the membrane being adhered to said plunger in sealed manner and having its filtration active side towards the outside, the sample vessel having a sealable opening in the bottom thereof, the mean density of said plunger being greater than the density of the filtration medium, and the length of said



plunger in cm being greater or equal to the reciprocal reduced by 1 of the mean plunger density in g/cm³.

4,490,257

PROCESS FOR PURIFICATION OF WASTE WATERS ACCUMULATED FROM PULP PRODUCTION, PARTICULARLY FROM CHLORINE BLEACHING OF PULP

Dieter J. Becker, Hohenlober Ring 30, 2087 Bonningstedt, Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 582,487
Claims priority, application Austria, Feb. 25, 1983, 671/83
Int. Cl.³ C02F 1/46
U.S. Cl. 210—610 9 Claims

1. A process for the purification of waste waters accumulating from pulp production, particularly from chlorine bleaching of pulp, which comprises the combination of the following steps:

(a) release of solid particles from the waste water in a series-connected, mechanical cleaning stage,

(b) introduction of the cleaned waste water into an electrolysis installation, wherein the waste water is subjected to anodic oxidation under constant movement, and an electric potential differential is plotted between the electrodes, and the pH of the waste water is set and maintained in a suitable manner at about 1 to 6.5,

(c) transfer of the waste water which is thus treated from stage (b) into a flocculation zone, in which an aqueous solution of a powerful cationic polyelectrolyte is added to the waste water under constant movement, and the pH is set and maintained at 1 to 6.5, and a flocculation of colloids and suspended components occurs,

(d) transfer of the treated waste water together with the flocculated products from stage (c) into another zone, in which the flocculated products are separated out,

(e) neutralization of the waste water freed of the flocculated products, and

(f) transfer of the neutralized waste water into an activated sludge installation, for biological decomposition of the organic products still present in the waste water by suitable microorganisms, with addition of additive nutritive materials, whereupon the waste water which is so clarified is discharged into a receiving stream.

4,490,258

SLUDGELESS OXIDATIVE BIOLOGICAL PURIFICATION PROCESS

Joseph J. Heijnen, SR 's-Gravenhage; Pieter A. Lourens, BT Delft; Cornelis P. Venema, JJ Delft, and Albert J. Vroemen, AP Breda, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Continuation-in-part of Ser. No. 404,050, Aug. 2, 1982, abandoned. This application May 19, 1983, Ser. No. 496,178

Claims priority, application Netherlands, Aug. 27, 1979, 7906426

Int. Cl.³ C02F 3/08

U.S. Cl. 210—617 7 Claims

1. A substantially sludgeless process for oxidative biological purification of waste water in a fluidized-bed reactor at a pH between 5 and 8 in the oxidation space comprising passing waste water upwards through an air-sparged oxidation space containing a fluidized state aerobic activated biomass attached to insoluble carrier particles of a size of 0.1 to 2 mm with a specific gravity of 2 to 5 g/cm^3, at such a rate that space loads of COD 4–50 kg/m^3 day are achieved while continuously and completely separating purified waste water leaving the oxidation space from said attached aerobic activated biomass, the improvement comprising that the waste water is purified with an aerobic activated biomass attached to said insoluble carrier particles under conditions of considerable stirring motions imparted to the fluidized-bed while, minimizing surplus formation of aerobic activated biamass by continuous control of the residence time of the waste water to be treated in the oxidation space between the limits of 0.3 to 20 hours, and degassing the purified waste water leaving the oxidation space in a separator placed above the oxidation space, while separating by gravity the solids, which are the biomass attached carrier particles, from the purified waste water and accomplishing the return of all the separated solids into the oxidation space by means of recycling by gravity forces alone and finally removing the purified waste water from the separator, wherein to prevent surplus formation of aerobic activated biomass and to exert at the same time adequate control of the pH in the oxidation space with the help of a sufficiently strong natural bicarbonate-carbon dioxide buffer formed only by oxidative microbiological carbon dioxide production from organic compounds of the waste water to be treated, the residence time of the waste water to be treated in the oxidation space is balanced to consume at least one gram of oxygen for each gram of COD converted, and the air-flow rate is maintained so that off-gas from the separator contains at least 5% by volume of oxygen and 1 to 15% dry volume of carbon dioxide.

4,490,259

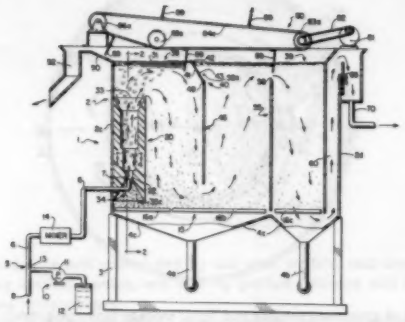
FLOTATION APPARATUS AND PROCESS UTILIZING A NOVEL MIXING AND FLOC DISPERSION MEANS

Samuel F. Coffing, Miami, Fla., assignor to International Resources Management, Inc., Coral Gables, Fla.

Filed Sep. 30, 1982, Ser. No. 428,776

Int. Cl.³ C02F 1/24

U.S. Cl. 210—704 21 Claims



1. An improved flotation apparatus for treating an effluent by forming a separable, buoyant floc from waste matter suspended in said effluent, comprising:

(a) a treatment tank for containing the effluent being treated;

(b) an inlet means for introducing a stream of effluent of cross-sectional area A into the tank;

(c) conditioning agent supply means for supplying a stream of conditioning agent to said stream of effluent;

(d) a bubble generator for introducing a stream of gas bubbles into said stream of effluent;

(e) a mixing and floc dispersion means for admixing said stream of effluent, conditioning agent and bubbles and for dampening fluid currents generated by said effluent stream and for uniformly dispersing the buoyant floc formed in said chambers across the width of an area of the surface being treated in said tank, including:

(i) a series of at least two elongated and fluidly connected chambers of increasing size, including first and second chambers;

(ii) an inlet port defined in the free end of the first chamber having a cross-sectional area greater than A for receiving said stream of effluent, conditioning agent and bubbles, and

(iii) an outlet port defined in the free end of the last chamber in fluid communication with the effluent being treated in said tank.

20. An improved flotation process for treating a stream of effluent by forming a separable, buoyant floc from waste matter suspended in said effluent, comprising the steps of:

(a) introducing said stream of untreated effluent into a tank containing effluent being treated;

(b) supplying a stream of conditioning agent to said stream of effluent;

(c) supplying a stream of gas bubbles to said stream of effluent;

(d) admixing said streams of untreated effluent, conditioning agent and bubbles and reducing the turbulent currents generated by the introduction of said effluent stream into the tank and uniformly distributing the resulting buoyant floc across an area of the surface of the effluent in the tank by directing said streams into an inlet port defined in the free end of the first of a series of at least two elongated, fluidly connected chambers, wherein each of said chambers has a constant cross-sectional area but wherein the cross-sectional area of each subsequent chamber is larger than the one before it, and wherein the free end of the last

of the series of chambers includes an outlet port in fluid communication with the effluent being treated in the tank.

4,490,260

MECHANICAL CONDITIONING AND FLOCCULATION OF LIQUIDS

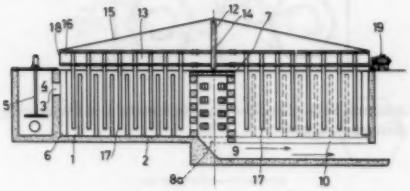
Richard P. Moore, Germiston, South Africa, assignor to Blue Circle Projects (Proprietary) Limited, Germiston, South Africa

Continuation of Ser. No. 436,656, Oct. 26, 1982, abandoned. This application Feb. 16, 1984, Ser. No. 579,298

Claims priority, application South Africa, Oct. 26, 1981, 81/7382

Int. Cl.³ C02F *1/52*

U.S. Cl. 210—738 **12 Claims**



1. Flocculation apparatus comprising: a circular flat bottomed chamber; a central circular flocculated liquid collecting well having a plurality of outlet openings through its wall spaced apart circumferentially and vertically to provide an even horizontal outlet flow throughout the depth of liquid in the chamber; a plurality of series of fixed blades extending radially from the well and vertically upward substantially the full depth of the chamber from the bottom of the chamber; a plurality of radially extending rotatable arms supported above the circular chamber, each arm carrying downwardly depending blades spaced apart along the length of the arms and positioned to intersperse with the plurality of series of vertical fixed blades; at least one initial feed chamber in communication with the circular chamber through an opening in the wall thereof; agitating means in the initial feed chamber to vigorously mix a liquid with a coagulant; means to deflect incoming liquid circumferentially around and vertically through the height of the circular chamber; means for rotating the arms; and, an outlet from the bottom of the collecting well to direct the fluid to a settling compartment.

4,490,261

ACIDIC HIGH TEMPERATURE STABLE AQUEOUS BRINE FLUIDS VISCOSIFIED BY BASIC N-HETEROCYCLIC POLYMERS

Israel J. Heilweil, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1982, Ser. No. 454,204

Int. Cl.³ C09K *7/00*; E21B *43/00*

U.S. Cl. 252—8.5 A **19 Claims**

1. An aqueous brine fluid having a pH of less than about 5, said fluid comprising:

(i) water;

(ii) a viscosity increasing amount of a N-heterocyclic polymer selected from the group consisting of poly-4-vinyl pyridine, poly-2-vinyl pyridine and mixtures thereof; and

(iii) at least about 30 percent by weight of compatible salt dissolved in said fluid.

4,490,262

METHOD OF SERVICING WELLBORES

Randall C. Stauffer, and Andrew J. Pasztor, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 939,509, Sep. 5, 1978, Pat. No. 4,304,677. This application Nov. 24, 1981, Ser. No. 324,517

The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

Int. Cl.³ E21B *33/13, 43/11, 43/00*

U.S. Cl. 252—8.55 R **20 Claims**

1. A process of preparing a high density well-servicing fluid comprising: reacting sufficient amounts of hydrogen bromide and zinc or a zinc compound in the presence of water and calcium bromide to form an aqueous solution of calcium bromide and zinc bromide having a density of at least about 15 pounds per gallon.

4,490,263

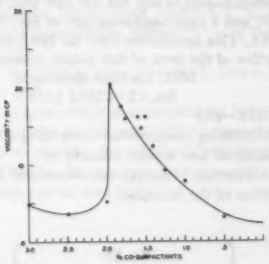
N,N-DISUBSTITUTED AMIDE COSURFACTANTS IN ENHANCED OIL RECOVERY PROCESSES

Paul R. Stapp, and Mary B. Chaney, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 10, 1982, Ser. No. 448,665

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—8.55 D **18 Claims**

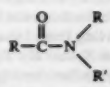


1. An aqueous surfactant composition consisting essentially of:

(a) sodium chloride;

(b) a hydrocarbon sulfonate surfactant selected from the group consisting of petroleum sulfonates, olefin sulfonates and alkyl sulfonates having an equivalent weight of from about 225 to about 600; and

(c) at least one N,N-disubstituted amide cosurfactant represented by the formula:

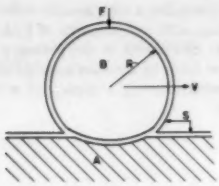


wherein R is either H, or a C_1 to C_5 alkyl radical and R′ is either methyl, ethyl, or propyl with the proviso that the amide has a maximum of 10 carbon atoms wherein said NaCl is present in an amount from 0.01–10 parts by weight, said surfactant is present in an amount from 0.15–15 parts by weight and said amide cosurfactant is present in an amount from 0.05–15 parts by weight.

4,490,264
DEVICE INCORPORATING A BEARING

Jan Gerkema, and Andries R. Miedema, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 5, 1982, Ser. No. 365,710
Claims priority, application Netherlands, Apr. 21, 1981, 8101931
Int. Cl.³ C10M 7/02
U.S. Cl. 252—12 2 Claims



1. A bearing coated with a lubricating layer consisting of an alloy of silver and 0.1–2 at.% of a metal selected from the group consisting of molybdenum and platinum.

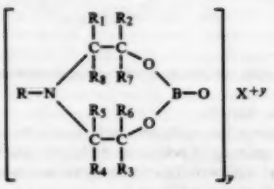
4,490,265
LUBRICATING COMPOSITIONS

Richard A. Holstedt, Whittier, Calif., and Peter Jessup, Millington, N.J., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 329,384, Dec. 10, 1981, Pat. No. 4,427,560, and a continuation-in-part of Ser. No. 329,385, Dec. 10, 1981,. This application Oct. 15, 1982, Ser. No. 434,602
The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.
Int. Cl.³ C10M 1/38
U.S. Cl. 252—47.5 46 Claims

1. A lubricating composition comprising a major amount of a lubricating oil and aminor amount of:

(A) an extreme pressure, anti-wear and friction reducing additive of the formula:



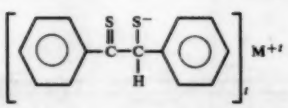
where R is hydrogen or an alkyl, alkene, alkadiene, aryl, alkylaryl or arylalkyl radical having from 1 to about 24 carbon atoms, R_1, R_2, R_3 and R_4 are the same or different radicals selected from hydrogen or alkyl, aryl, alkylaryl or arylalkyl radicals having from 1 to about 30 carbon atoms, wherein at least one of said R_1, R_2, R_3 or R_4 is an aryl, alkylaryl or arylalkyl radical having from about 6 to about carbon atoms, R_5, R_6, R_7 and R_8 are the same or different radicals selected from hydrogen or an alkyl radical having from 1 to about 6 carbon atoms, Y is an integer between 1 and 4, and X is hydrogen or a metal selected from a transition metal having an atomic number of 21 through 30 or a Group IVA metal;

(B) A copper corrosion inhibitor comprising a compound having the formula:

wherein R_9 and R_{10} are the same or different moieties selected from hydrogen or straight or branched chain alkyl, cyclic or alicyclic alkyl, aryl, alkylaryl or arylalkyl radicals having from 2 to about 30 carbon atoms, provided that R_9 and R_{10} are not both hydrogen and w and z are the same or different integers between 1 and 8;

(C) A lead corrosion inhibitor comprising terephthalic acid; and

(D) An oxidation inhibitor comprising: a metal additive having the formula:



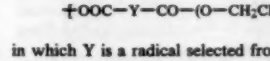
wherein M is a first row transition metal and t is an integer between 1 and 4.

4,490,266
PROCESS FOR THE PREPARATION OF LIQUIDS OF LOW INFLAMMABILITY AND HIGH VISCOSITY INDEX AND THE USE THEREOF

Karl-Heinz Hentschel, Krefeld; Bernhard Müssig, Seevetal; Rolf Dhein, Krefeld, and Siegfried Kussi, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

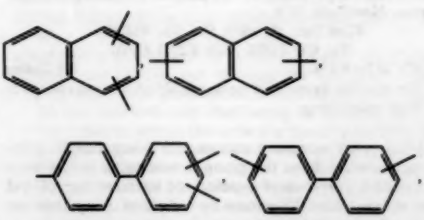
Filed May 24, 1983, Ser. No. 497,529
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1982, 3221137
Int. Cl.³ C10M 1/46, 1/26
U.S. Cl. 252—49.8 19 Claims

1. A composition comprising 96–99.9% by weight of a highly flame-resistant base oil containing aromatic structures and 0.1–4% by weight of a polyester of the formula I



(I)

in which Y is a radical selected from the group consisting of C_2–C_{40}-alkylene, cycloalkylene which has 5 to 40 C atoms and which contains cyclopentyl radicals attached to one another, cycloalkylene which has 5 to 40 C atoms and which contains cyclohexyl radicals attached to one another, cycloalkylene which has 5 to 40 C atoms and which contains cyclopentyl and cyclohexyl radicals attached to each other, 1,2-phenylene, 1,3-phenylene, 1,4-phenylene,



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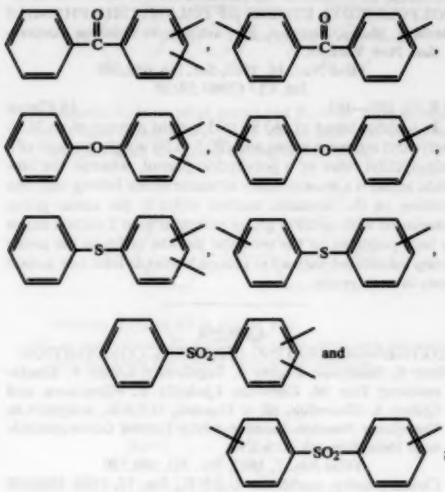


n denotes an integer from 5 to 140 and X represents a number such that the weight average molecular weight gives a value of 20,000 to 300,000.

4,490,267

PREPARATION OF A LUBRICATING OIL ADDITIVE, AN ADDITIVE THUS PREPARED AND A LUBRICATING OIL CONTAINING THIS ADDITIVE

Rudolf J. A. Eckert, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 13, 1983, Ser. No. 503,953

Claims priority, application United Kingdom, Dec. 31, 1982, 8237086

Int. Cl.³ C10M 1/32, 1/28

U.S. Cl. 252—56 R 16 Claims

1. A process for the preparation of a lubricating oil additive comprising polymerizing one or more C_{1-30}-alkyl(meth)acrylates, and optionally at least one further monomer in a solvent, preferably a base oil, containing an at least partially hydrogenated polymer of a conjugated diene and optionally a monoalkenyl arene, wherein said polymer is a star-shaped polymer comprising a nucleus and polymeric arms linked to said nucleus wherein said arms are selected from the group consisting of:

(i) at least partially hydrogenated homopolymers and at least partially hydrogenated copolymers of conjugated dienes;

(ii) at least partially hydrogenated copolymers of conjugated dienes and monoalkenyl arenes;

(iii) homopolymers and copolymers of alkenyl arenes; and

(iv) mixtures thereof, wherein, the molar ratio of the acrylate and the further monomer(s) is between about 10:0 to about 10:5; the solvent is selected from the group consisting of base oil, C_{18}-alkylxylenes and less substituted benzenes; at the start of the process the reaction mixture contains 0.5 to 35 percent by weight of the star-shaped polymer and 5 to 50 percent by weight of the acrylate; and the polymerization temperature is between about 50° and about 150° C.

4,490,268

PROCESS OF PREPARING MAGNETIC SPINEL FERRITE HAVING ACCURATE PREDETERMINED TRANSITION TEMPERATURE

Dimiter I. Tchernev, 3905 Sierra Dr., Austin, Tex. 78731

Division of Ser. No. 881,592, Feb. 27, 1978, Pat. No. 4,208,911, which is a continuation of Ser. No. 781,952, Mar. 28, 1977, abandoned, which is a continuation of Ser. No. 293,592, Sep. 29, 1972, abandoned. This application Jun. 23, 1980, Ser. No. 161,689

Int. Cl.³ C04B 35/30

U.S. Cl. 252—62.62 7 Claims

1. A method of producing a magnetic spinel ferrite having a desired transition temperature within an accuracy of at least 0.1° C. which comprises the steps of:

(1) providing a homogeneous oxidic mixture corresponding to the formula: $R_{(1-x)}T_xFe_2O_4$, which when sintered into a ferrite exhibits a transition temperature which is within about 2° C. of the desired transition temperature, where "R" is an element selected from the iron group, atomic numbers 22–30, the palladium group, atomic numbers 40–48, the platinum group, atomic numbers 72–80 and Li, "T" is a non-magnetic element selected from the group consisting of zinc, yttrium, cadmium, titanium, zirconium and a different R element and "x" is between 0 and 1;

(2) adding a quantity "a" of T to said mixture to produce a mixture having a formula $R_{(1-x)}T_{(x+a)}Fe_2O_4$, which when sintered into a ferrite exhibits a substantially constant permeability relative to temperature up to the transition temperature, wherein "a" is from 0.05 to 0.2;

(3) introducing by liquid diffusion into the mixture formed in step (2) a quantity "b" of R to provide a formulation $R_{(1-x+b)}T_{(x+a)}Fe_2O_4$, which when sintered into a ferrite exhibits a transition temperature within 0.1° C. of the desired transition temperature, where "b" is in the range of 10^{-1} to 10^{-6};

(4) forming the resulting mixture of step (3) into a desired shaped article; and

(5) sintering the shaped article at a temperature between the melting point of the ferrite and 100° C. less than said melting point to convert the article into said magnetic spinel ferrite having the desired transition temperature within a accuracy of at least 0.1° C.

4,490,269

EFFERVESCENT DENTURE CLEANING COMPOSITION COMPRISING MONOPERPHTHALATE

Andrew R. Gallopo, Garfield, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 13, 1984, Ser. No. 570,475

Int. Cl.³ C11D 7/12, 7/38, 7/54

U.S. Cl. 252—94 31 Claims

1. An effervescent denture cleansing composition, which comprises; an effervescent agent and a monoperphthalate as the bleaching agent in an amount of about 12% to about 70% by weight of the overall composition.

30. A denture cleansing composition, which comprises;

(a) About 12% to about 70% by weight of a monoperphthalate as the bleaching agent;

(b) about 5% to about 30% by weight of a sequestering agent;

(c) about 0.1% to about 1.0% by weight of a pressing aid;

(d) about 2% to about 40% by weight of sodium carbonate, and

(e) remainder being an effervescent agent.

4,490,270

SANITIZING LIQUID SHAMPOO FOR CARPETS

Walter J. Hackett, Westminster, and Kyle K. Ito, Huntington Beach, both of Calif., assignors to Purex Corporation, Lakewood, Calif.

Filed Jul. 28, 1982, Ser. No. 402,587
Int. Cl.³ C11D 3/44, 3/48
U.S. Cl. 252—106 14 Claims

1. An aqueous solution composition for use in cleaning and sanitizing carpets and the like that consists essentially of the following ingredients in the stated relative weight percents:

(a) between 0.1 and 20.0 weight percent surfactant, selected from the group consisting of sodium lauryl sulfate, a fatty acid alkylolamide sulfosuccinate and sodium lauryl ether sulfate,

(b) between 0.03 and 5.0 weight percent monopotassium phosphate,

(c) between 0.05 and 5.0 weight percent glutaraldehyde,

(d) solvent that consists essentially of about 3.0 weight percent isopropanol, about 2.0 weight percent propylene glycol methyl ether, and about 0.25 weight percent amyl acetate,

(e) between 0.002 and 1.0 weight percent optical brightener, and the balance water.

4,490,271

DETERGENT COMPOSITIONS CONTAINING POLYETHYLENE GLYCOL AND POLYACRYLATE

Gianfranco L. Spadini, Wyoming; Antoinette L. Larrabee, and Don K. K. Liu, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 30, 1983, Ser. No. 509,884
Int. Cl.³ C11D 3/37, 3/08, 17/06
U.S. Cl. 252—174.23 16 Claims

1. A detergent composition comprising:

(a) from about 5% to about 50% by weight of an organic surfactant selected from the group consisting of anionic, nonionic, zwitterionic, ampholytic and cationic surfactants, and mixtures thereof;

(b) from about 5% to about 80% by weight of a non-phosphorus detergent builder;

(c) from about 1% to about 20% of a mixture of a polyethylene glycol and a polyacrylate, said mixture having a polyethylene glycol:polyacrylate weight ratio of from about 1:10 to about 10:1, said polyethylene glycol having a weight average molecular weight of from about 1,000 to about 50,000, and said polyacrylate having a weight average molecular weight of from about 1,000 to about 20,000.

4,490,272

COMPOSITIONS WITH A POTASSIUM SUPEROXIDE BASE AND THEIR APPLICATIONS

Jean Malafosse, 3, rue Dewet, 71.100 Chalon-sur-Saone; Gérard Varlot, 67, rue de Corcelles, 71.530 Chalon-sur-Saone, and Michel Pierre, 3, rue du Bois de Menuse, Saint Jean des Vignes, 71.100 Chalon-sur-Saone, all of France

Filed Jan. 24, 1983, Ser. No. 460,542
Claims priority, application France, Feb. 5, 1982, 82 01844
Int. Cl.³ C08K 3/18
U.S. Cl. 252—181.3 10 Claims

1. Composition with a potassium superoxide base characterized by the addition to the potassium superoxide of an oxide of an alkaline-earth metal or magnesium incorporated in a concentration between 2 and 30% by weight in relation to the total mixture.

4,490,273

STABLE BLENDS OF N,N-DIGLYCIDYL AMINES AND POLYGLYCIDYL ETHERS OF POLYHYDRIC PHENOLS

David A. Shimp, Prospect, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 16, 1983, Ser. No. 552,568
Int. Cl.³ C08G 59/28
U.S. Cl. 252—182 15 Claims

1. A stable blend of (A) 95 to 5 weight percent of an N,N-diglycidyl aromatic amine and (B) 5 to 95 weight percent of a polyglycidyl ether of a polyhydric phenol, wherein the aromatic amine is a monoprimary aromatic amine having only one position on the aromatic nucleus ortho to the amine group substituted with an alkyl group having at least 2 carbon atoms or both positions on the aromatic nucleus ortho to the amine group substituted with alkyl groups having at least one carbon atom in each group.

4,490,274

OXYGEN-GENERATING CHEMICAL COMPOSITION

Viktor S. Maslyaev; Evgeny S. Sagalovsky; Galina P. Khudosovtseva; Petr M. Gorovets; Ljudmila Y. Filimonova, and Ljubov A. Zborschik, all of Donetsk, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Gornospasatelnogo Dela, Donetsk, U.S.S.R.

Filed Jun. 7, 1983, Ser. No. 501,720
Claims priority, application U.S.S.R., Jan. 17, 1983, 3530203
Int. Cl.³ C01B 15/043, 13/02; C09K 3/00
U.S. Cl. 252—186.22 1 Claim

1. A chemical composition which generates oxygen on being activated, for use in breathing mixtures which comprises oxygenic ingredients as well as activators, the oxygenic ingredients being potassium superoxide and sodium peroxide and the activators being aluminium hydroxide, manganese dioxide and powerded aluminium all taken in a proportion as follows, wt.%:

sodium peroxide, Na_2O_2, 10–20;
aluminium hydroxide, $Al(OH)_3$, 15–25;
manganese dioxide, MnO_2, 5–7;
powdered aluminium, Al, 2.5–3.5;
potassium superoxide, the balance.

4,490,275

METHOD AND COMPOSITION FOR NEUTRALIZING ACIDIC COMPONENTS IN PETROLEUM REFINING UNITS

Joseph H. Y. Niu, Houston, Tex., assignor to Betz Laboratories Inc., Trevose, Pa.

Division of Ser. No. 479,386, Mar. 28, 1983, Pat. No. 4,430,196.
This application Oct. 7, 1983, Ser. No. 540,217
Int. Cl.³ C09K 3/00
U.S. Cl. 252—189 3 Claims

1. Aqueous composition for neutralizing acidic components of a distilling petroleum product consisting essentially of dimethylaminoethanol (DMAE) and dimethylisopropanolamine (DMIPA), said DMAE and DMIPA being present, on a weight basis, in a ratio of about 1–10:10–1 DMAE:DMIPA.

4,490,276

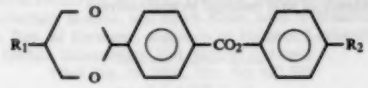
LIQUID CRYSTAL ADMIXTURES INCLUDING CHLORO-CYANOPHENYL SUBSTITUTED BENZOATES

Ying-Yen Hsu, Los Altos, Calif., assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 420,168
Int. Cl.³ C09K 3/34; G02F 1/13
U.S. Cl. 252—299.61 11 Claims

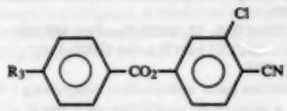
1. A nematic liquid crystal admixture for an electrooptic display wherein said mixture comprises

(a) at least about 17 weight % of at least one compound selected from the group having the formula:



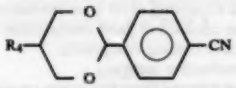
wherein R_1 is an alkyl group and R_2 is an alkyl group;

(b) at least about 6 weight % of at least one compound selected from the group having the formula:



wherein R_3 is an alkyl group; and

(c) at least about 20 weight % of at least one compound selected from the group having the formula:



wherein

R_4 is an alkyl group;

and wherein all alkyl groups are of 1–8 carbon atoms.

4,490,277

MESOMORPHIC MATERIAL WITH LOW OPTICAL ANISOTROPY AND PROCESS FOR PRODUCING SAME

Mikhail F. Grebenkin, Linia Oktyap rskoi zheleznoi dorogi, 10, kv. 79, Moscow; Alexandr V. Ivashenko, ulitsa Pervomaiskaya, 44a, kv. 57, Dolgoprudny Moskovskoi oblasti; Ljudmila A. Karamysheva, ulitsa Poltavskaya, 2, kv. 126; Lev M. Blinov, ulitsa Dubninskaya, 2, korpus 5, kv. 79, both of Moscow; Evgeny I. Kovshev, ulitsa Kirova, 12, kv. 15, Khimki Moskovskoi oblasti; Nikolai M. Shtykov, Likhachevskoe shosse, 11, kv. 45, Dolgoprudny Moskovskoi oblasti; Viktor V. Titov, ulitsa Festivalnaya, 12, kv. 95, Moscow; Vadim M. Shoshin, ulitsa Polevaya, 7, kv. 69, Moscow; Irina F. Agafonova, Dmitrovskoe shosse, 105, korpus 2, kv. 39, Moscow, and Mikhail I. Barnik, Likhachevskoe shosse, 20, kv. 212, Dolgoprudny Moskovskoi oblasti, all of U.S.S.R.

Filed May 29, 1981, Ser. No. 269,024

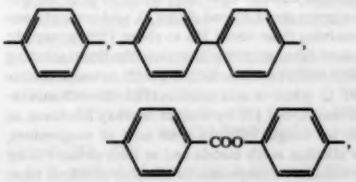
Int. Cl.³ C09K 3/34; G02F 1/13

U.S. Cl. 252—299.6 **1 Claim**

1. A mesomorphic material with a low value of optical anisotropy which comprises at least one aromatic nitrile selected from the class of aromatic nitriles represented by compounds of the general formula

$$R(O)_m—X—CN$$

where m=0 or 1, R is alkyl with 4 to 7 carbon atoms, and X is



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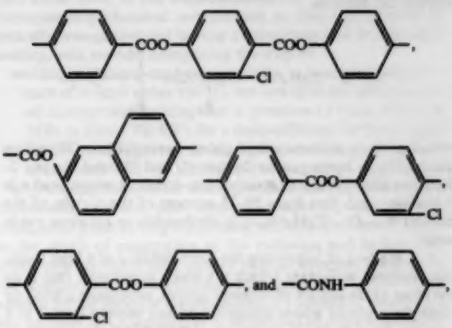


said aromatic nitrile being present in an amount ranging from 4.9 to 19.3% by weight, and a mixture of 4-n-butyltranscyclohexane carboxylic acid and 4-n-hexyltranscyclohexane carboxylic acid, said mixture being present in an amount ranging from 80.7% to 95.1% by weight and the molar ratio between said carboxylic acids in said mixture being 1:1.

4,490,278

LIQUID CRYSTAL SUBSTITUTED TRANS-4-N-ALKYLCYCLOHEXANES AND SUBST.-3-SUBST.-BENZOYLOXY-[TRANS-4-N-ALKYLCYCLOHEXANE]S

Herrmann Schubert, Dorfstrasse 9, DDR-4101 Nehlitz; Hans-Joachim Deutscher, Block 484-4, DDR-4090 Halle; Horst Kresse, Puschkinstrasse 18, DDR-4020 Halle; Dietrich Demus, Veilchenweg 22, DDR-4020 Halle; Heinz Altmann, Adolfstrasse 3, DDR-4020 Halle; Marlies Körber, Rolandweg 13, DDR-5500 Nordhausen, and Ute Böttger, Röpziger Strasse 10, DDR-4020 Halle, all of German Democratic Rep.

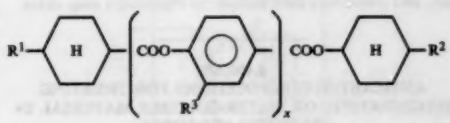
Filed Sep. 22, 1980, Ser. No. 189,542

Claims priority, application German Democratic Rep., Sep. 24, 1979, 215742; Sep. 24, 1979, 215743

Int. Cl.³ C09K 3/34; C07C 69/75, 69/78, 69/90, 67/14

U.S. Cl. 252—299.63 **9 Claims**

1. Liquid crystal 4-trans-4-n-alkylcyclohexanoyloxy-trans-n-alkyl-cyclohexanes and/or 4-trans-4-n-alkylcyclohexanoyloxy-3-subst.-benzoyloxy-trans-4-n-alkylcyclohexanes respectively having the general formula



where $R^1=C_nH_{2n+1}$; $R^2=C_mH_{2m+1}$; R^3=H,CH_3, CH_2H_5, Cl, Br and X=1; m, n=1 to 10.

4,490,279

FOAM-STABILIZED COMPOSITIONS

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

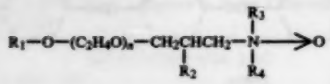
Continuation-in-part of Ser. No. 85,885, Oct. 17, 1979, abandoned. This application Aug. 17, 1981, Ser. No. 293,100

Int. Cl.³ B01F 17/16; C11D 1/75

U.S. Cl. 252—357 **7 Claims**

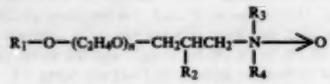
1. A composition consisting essentially of (a) a nonionic surfactant which is a block copolymer that is an alkylene oxide adduct of ethylene glycol, propylene glycol, or diethylene

glycol, and (b) a foam-stabilizing amount of an amine oxide having the formula



wherein R_1 is a linear alkyl group having 10 to 20 carbon atoms, R_2 is hydrogen or hydroxyl, and R_3 and R_4 are 2-hydroxyalkyl groups containing 2 to 4 carbon atoms, and n is a number such that from 50–75 percent of the weight of the radical $R_1—O—(C_2H_4O)_n—$ is attributable to ethylene oxide units.

6. A method of improving the foam stability of a high foaming nonionic surfactant which is a block copolymer that is an alkylene oxide adduct of ethylene glycol, propylene glycol, or diethylene glycol which comprises adding thereto from 1 to 6 percent by weight of an amine-oxide having the structural formula



wherein R_1 is a linear alkyl group having 10 to 20 carbon atoms, R_2 is hydrogen or hydroxyl, R_3 and R_4 are 2-hydroxyl groups containing 2 to 4 carbon atoms, and n is a number such that from 50–75 percent of the weight of the radical $R_1—O—(C_2H_4O)_n—$ is attributable to ethylene oxide units.

4,490,280

PROCESS FOR MANUFACTURING TRANSLUCENT ANTIBACTERIAL SOAP

David P. Joshi, Plainfield, N.J., and Peter A. Divone, Woodhaven, N.Y., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 2, 1982, Ser. No. 414,445

Int. Cl.³ C11D *9/50, 13/20, 7/26*

U.S. Cl. 252—368 **11 Claims**

1. A process for manufacturing a translucent antibacterial soap which comprises dissolving an antibacterial proportion of 2,4,4'-trichloro-2'-hydroxydiphenyl ether (THDE) in liquid lanolin fatty acids which function as superfatting and translucence promoting agents in the translucent antibacterial soap, mixing the dissolved THDE in the lanolin fatty acids with a normally solid higher fatty acid soap in liquid state, admixing with such mixture other components of a translucent soap, if any, and converting such mixture to translucent soap cakes.

4,490,281

ANTICAKING COMPOSITIONS FOR TREATING HYGROSCOPIC OR WATER-SOLUBLE MATERIAL IN PARTICULATE FORM

Alan D. James, Rochdale, and Roy Senior, Rossendale, both of England, assignors to Akzona Incorporated, Enka, N.C.

Filed Nov. 26, 1982, Ser. No. 444,657

Claims priority, application European Pat. Off., Dec. 4, 1981, 81201323.3

Int. Cl.³ C09K *3/00*; A23L *1/00*

U.S. Cl. 252—382 **12 Claims**

1. An anticaking composition comprising a dispersion of an alkyl or cycloalkyl amine in a liquid medium comprising a water-in-oil emulsion containing mineral oil as the oil phase and from about 5 to about 60 percent, by weight, of water.

7. A method of treating hygroscopic or water soluble material in particulate form comprising contacting said material with an anticaking composition which comprises a dispersion of an alkyl or cycloalkylamine in a liquid medium comprising a water-in-oil emulsion containing from about 5 to about 60 percent, by weight, of water, in an amount sufficient to reduce the tendency of said material to agglomerate.

4,490,282

CONDUCTIVE PAINT COMPOSITION

Thomas A. Corboy, 18424 Santa Alberta, Fountain Valley, Calif. 92708, and Joseph Philipson, 1485 Old House Rd., Pasadena, Calif. 91107

Filed Feb. 18, 1983, Ser. No. 467,958

Int. Cl.³ H01B *1/04*; C08R *5/07*

U.S. Cl. 252—503 **39 Claims**

1. A conductive paint composition comprising a hardenable fluid binder, a mixture of conductive particles in an amount of from about 20% to about 80% by weight of the conductive paint composition, said mixture comprising carbon particles and metal particles selected from a group of nickel particles, aluminum particles and mixtures thereof 1,4-pentanedione in an amount of the about 7% by weight of the conductive paint composition and a coupling agent in an amount up to about 2% by weight of the conductive paint composition.

33. A conductive coating comprising:

a solid non-conductive matrix;

metal particles selected from the group consisting of nickel particles, aluminum particles and mixtures thereof in an amount of from about 15% by weight to about 70% by weight of the conductive coating;

carbon particles in an amount of from about 2% by weight to about 20% by weight of the conductive coating;

2,4-pentanedione in an amount of up to about 7% by weight of the conductive coating; and

at least one coupling agent in an amount of less than about 2% by weight of the conductive coating.

4,490,283

FLAME RETARDANT THERMOPLASTIC MOLDING COMPOUNDS OF HIGH ELECTROCONDUCTIVITY

Lothar W. Kleiner, Mentor, Ohio, assignor to Mitech Corporation, Willoughby, Ohio

Continuation-in-part of Ser. No. 238,757, Feb. 27, 1981, abandoned. This application Dec. 18, 1981, Ser. No. 332,000

Int. Cl.³ H01B *1/02*

U.S. Cl. 252—512 **16 Claims**

1. A flame retardant, thermpolastic molding composition of high electroconductivity comprising between about 12% and about 40% by volume of fine solid, conductive metallic particles of anisometric shape having an aspect ratio of at least 10 to 1 and an average minimum characteristic linear dimension (thickness) of at last about 1 micron but not over about 100 microns, dispersed within a cementitious matrix having a chlorine content of at least about 24% by weight and composed predominantly of thermoplastic resins at least about half of which by weight is made up of vinyl chloride polymers which have a vinyl chloride content of at least about 80% by weight and K values between about 45 and about 70, said cementitious matrix also containing from about 3% to about 15% by weight of a well balanced lubricant/stabilizer combination including at least two different lubricants which are solid at temperatures up to at least 50° C. wherein said stabilizer/lubricant combination includes at least about 1% by weight of waxy lubricant, at least about 1% by weight of fatty acid salts of magnesium, lithium and/or alkaline earth metals and at least about 1% by weight of heat stabilizer compounds of metallic elements from Group IVA or VA of the Periodic Table.

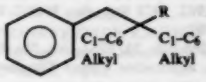
4,490,284

1,1-DI(C_1-C_6-ALKYL)-2-PHENYL-ETHANE DERIVATIVES AS PERFUMING INGREDIENTS

Ernst-Joachim Brunke, and Erich Klein, both of Holzminden, Fed. Rep. of Germany, assignors to Dragoco Gerberding & Co. GmbH, Holzminden, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,989
Int. Cl.³ A61K 7/46
U.S. Cl. 252—522 R 19 Claims

1. A process for imparting, enhancing or modifying the flowery odorous note in perfumes, perfume compositions or artificial essential oils, for use in a perfume composition, a perfumed article, a cologne, a foodstuff, an alcoholic or nonalcoholic beverage, a toothpaste, a medicinal product or a chewing gum, comprising the step of adding an organoleptic property modifying quantity of a compound of the formula:



wherein R is a formyl-, hydroxymethyl-, formoxymethyl-, acetoxymethyl- group and the total number of carbon atoms in both alkyl substituents together is at most 8.

4,490,285

HEAVY-DUTY LIQUID DETERGENT COMPOSITION

Ertugrul S. Kebanli, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 2, 1983, Ser. No. 519,611
Int. Cl.³ C11D 1/83, 7/42
U.S. Cl. 252—551 9 Claims

1. A heavy-duty liquid detergent composition comprising, by weight:

(1) from about 10% to about 40% of a nonionic surfactant produced by condensing from about 3 to about 10 moles of ethylene oxide with 1 mole of an alcohol having a straight or branched alkyl chain containing from about 8 to about 16 carbon atoms, said nonionic surfactant having an HLB of from about 8 to about 15;

(2) from about 5% to about 20%, of an acid basis, of an anionic surfactant which is a sulfated condensation product of an alcohol having a straight or branched alkyl chain containing from about 10 to about 18 carbon atoms with from about 0.8 to about 1.5 moles of ethylene oxide per mole of alcohol; the weight ratio of (1) to (2) being from about 2:1 to about 4:1; and

(3) from about 40% to about 85% of a solvent system comprising water, or mixtures thereof with an alcohol containing from 1 to 6 carbon atoms or a polyol containing from 2 to 6 carbon atoms and from 2 to 6 hydroxy groups.

4,490,286

PHOTOCHROMIC AND/OR CATHODOCHROMIC SODALITE MATERIAL, METHOD OF ITS PREPARATION, AND SENSING ELEMENT OF A VARIABLE LIGHT TRANSMISSION DEVICE MANUFACTURED FROM SUCH MATERIAL

Filipp K. Volynets; Vladimir A. Demidenko, both of Leningrad; Roman A. Denisov; Viktor P. Denx, both of Tartu; Alexandr E. Dydeizak, Tartu; Engels N. Ryzhikov, and Evgenia A. Terentieva, both of Leningrad, all of U.S.S.R., assignors to Institut Fiziki Akademii Nauk Estonskoi SSR, Tartu, U.S.S.R.

PCT No. PCT/SU81/00030, § 371 Date Dec. 14, 1981, § 102(e) Date Dec. 14, 1981, PCT Pub. No. WO81/03036, PCT Pub. Date Oct. 29, 1981
PCT Filed Mar. 31, 1981, Ser. No. 333,853
Int. Cl.³ C30B 29/34
U.S. Cl. 252—583 5 Claims

1. A method of preparing a photochromic and/or cathodochromic material of the sodalite series comprised of a homogeneous polycrystalline monolith having a density of at least about 99% of the theoretical density of sodalite of the corresponding chemical composition so that the material is optically transparent and having a temperature of incongruent melting, said method comprising the step of:

molding a halogen-containing sodalite powder at a temperature of at least about 800° C. but less than the temperature of incongruent melting and a pressure of from about 50 MPa to about 300 MPa for a time sufficient for the density of the material being molded to reach said density of at least about 99% of the theoretical density of sodalite.

4. A sensing element for sensing radiation in a variable light transmission device, said element comprising an optically transparent plate having a thickness which is less than or equal to the depth of penetration of the radiation and being comprised of a photochromic and/or cathodochromic material of the sodalite series, the chemical composition of which is described by the formula $Na_6Al_6Si_6O_{24}$ $2(1-n)NaX$, where X is any halogen or a combination of halogens and n is a nonstoichiometric value lying within the range of $0.05 \leq n \leq 0.70$, said material comprising a homogeneous polycrystalline monolith having a density of about 99% of the theoretical density of sodalite of the corresponding chemical composition so that the material is optically transparent.

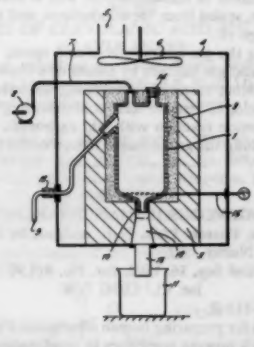
5. A photochromic and/or cathodochromic material of the sodalite series, the chemical composition of which is described by the formula $Na_6Al_6Si_6O_{24}$ $2(1-n)NaX$, where X is any halogen or a combination of halogens and n is a nonstoichiometric value lying within the range of $0.05 \leq n \leq 0.70$, said material comprising a homogeneous polycrystalline monolith having a density of at least about 99% of the theoretical density of the sodalite of the corresponding chemical composition so that the material is optically transparent.

4,490,287

TREATMENT OF SUBSTANCES

William H. Hardwick, Didcot, and Ronald Gayler, Wantage, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 94,857, Nov. 16, 1979, abandoned, which is a division of Ser. No. 816,684, Jul. 18, 1977, Pat. No. 4,221,680. This application Mar. 15, 1982, Ser. No. 358,047
Claims priority, application United Kingdom, Jul. 29, 1976, 31745/76
Int. Cl.³ G21F 9/16
U.S. Cl. 252—629 7 Claims



1. A process for the treatment of a substance contained in an aqueous solution or slurry containing radioactive waste whereby the substance is incorporated in a glass-like or ceramic material, which comprises:

subjecting the solution or slurry containing radioactive waste to the influence of microwave radiation in a fluid-

ized bed to dry the solution or slurry and thereby produce a fusible dried product;

feeding particles of glass-formers to said fluidized bed to produce product particles of glass-formers coated with the fusible dried product formed from said solution or slurry containing the radioactive waste;

scrubbing off-gases from the fluidized bed to remove dust by counter-currently contacting said off-gases with said particles entering the fluidized bed;

heating said product particles to fuse them; and

cooling the fused product particles to produce a glass-like or ceramic material comprising said substance.

4,490,288

METHOD AND SYSTEM FOR REMOVING TRITIUM FROM A GAS MIXTURE

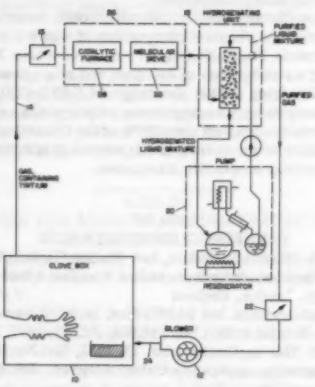
Heinrich Weichselgartner, Munich, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

Filed Jul. 6, 1981, Ser. No. 280,874

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1980, 3025494

Int. Cl.³ G21F 9/02

U.S. Cl. 252—630 **5 Claims**



1. A method for rapidly removing essentially all of the tritium from a gas mixture, which mixture comprises trace amounts of tritium as contamination, and is contained in an enclosed space, sealed from the atmosphere, said method comprising the steps of

(a) removing the gas mixture from said space;

(b) passing said gas mixture by means of a blower through a hydrogenating material, comprising an unsaturated carboxylic acid, to remove said contaminating tritium by a hydrogenation reaction with said carboxylic acid; and

(c) recirculating the gas obtained from step (b) to said space.

4,490,289

HOMOGENEOUS HUMAN INTERLEUKIN 2

Alvin S. Stern, Passaic Park, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 16, 1982, Ser. No. 418,927

Int. Cl.³ C07G 7/00

U.S. Cl. 260—112 R **5 Claims**

1. A process for preparing human interleukin 2 in homogeneous form which process comprises in combination:

A. passing a solution of crude human interleukin 2 through a reverse phase high performance column containing methyl or octyl groups covalently bonded to silica gel whereby said human interleukin 2 is retained by said column, eluting said column under HPLC conditions with a buffered n-propanol 0–60% gradient and pooling fractions exhibiting human interleukin 2 activity; and

B. passing the pooled active fractions from step A above through a reverse phase high performance column containing diphenyl groups covalently bonded to silica gel whereby said human interleukin 2 is retained by said column, eluting said column under HPLC conditions with a buffered n-propanol 20–60% gradient and pooling fractions exhibiting human interleukin 2 activity and optionally repeating step A and/or B.

4,490,290

PROCESS FOR THE RECOVERY OF IMMUNOGLOBULINS

Mohamed M. Gani, Bedfordshire; Keith May, and Philip Porter, both of Bedford, all of England, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

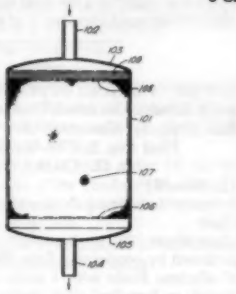
PCT No. PCT/GB82/00060, § 371 Date Sep. 22, 1982, § 102(e) Date Sep. 22, 1982, PCT Pub. No. WO82/02818, PCT Pub. Date Sep. 2, 1982

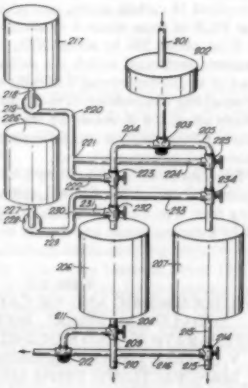
PCT Filed Feb. 24, 1982, Ser. No. 425,099

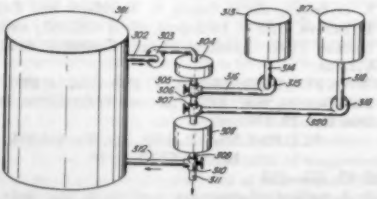
Claims priority, application United Kingdom, Feb. 26, 1981, 8106099

Int. Cl.³ A61K 35/16; A23J 1/20

U.S. Cl. 260—112 B **6 Claims**







1. A process for the recovery of immunoglobulins of high

purity and potency from natural sources such as a milk and blood serum, characterised in that a source of immunoglobulins is contacted with an isoluble carrier material to which is bound a low-affinity monoclonal antibody specific to one or more of the immunoglobulins but not specific to any other common constituent of the source, the antibody binds immunoglobulin molecules and, following removal of the residue of the source, immunoglobulin molecules are released from the antibody.

4,490,291

NONAPEPTIDE AMIDES

Masahiko Fujino, Hyogo, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 491,482, Jul. 24, 1974, abandoned. This application Jul. 17, 1975, Ser. No. 596,810

Claims priority, application Japan, Jul. 24, 1973, 83389; Mar. 19, 1974, 31734

Int. Cl.³ C07C *103/52*; A61K *37/00*

U.S. Cl. 260—112.5 LH **18 Claims**

1. A compound of the formula

(Pyr)Glu—R_1—Trp—Ser—R_2—(D)—Ala—R_3—Arg—Pro—NH—R_4

wherein R_1 is His, Tyr, or p—NH_2—Phe, R_2 is Tyr or Phe, R_3 is Leu, Ile or Nle and R_4 is alkyl of 1 to 3 carbon atoms which may be substituted therefor, by hydroxy.

4,490,292

1,5-BENZOTHIAZEPINE DERIVATIVES AND PRODUCTION THEREOF

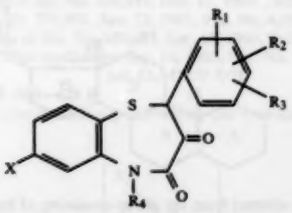
Yoshifumi Maki, Gifu; Magoichi Sako, Seki; Naomichi Mitsumori, Himeji; Sadayuki Maeda, Osaka, and Masahiro Takaya, Yasu, all of Japan, assignors to Hamari Chemicals, Ltd., Osaka, Japan

Filed Oct. 7, 1983, Ser. No. 540,000

Int. Cl.³ C07D *281/02*

U.S. Cl. 260—239.3 B **9 Claims**

1. A benzothiazepine compound of the formula:



I

wherein R_1, R_2 and R_3 each independently denotes hydrogen, halogen, a lower alkyl group, a lower alkoxy group or a hydroxy group; R_4 denotes a lower alkyl group, an allyl group, a lower alkoxy-alkyl group, a lower alkyl group substituted with a hydroxy group or a halogen, a lower alkylaminoalkyl group or a morpholino lower alkyl group; X denotes a halogen or hydrogen, and an acid salt thereof.

4,490,293

2,5,6,8,9-PENTA-ALKYL OR PENTA-ARALKYL-SUBSTITUTED 1,3,7-TRIAZABICYCLO(3,3,1) NON-3-ENES AND TRIALKYL OR TRIARALKYL-SUBSTITUTED TETRAHYDROPYRIMIDINES

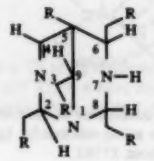
Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 404,007, Aug. 2, 1982, abandoned, which is a continuation of Ser. No. 932,088, Aug. 7, 1978, abandoned. This application Jan. 3, 1983, Ser. No. 454,940

Int. Cl.³ C07D *487/18, 251/00, 239/70*

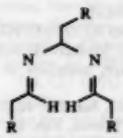
U.S. Cl. 260—243.3 **13 Claims**

1. A process of preparing a mixture of penta-alkyl or penta-aralkyl-substituted 1,3,7-triazabicyclo (3,3,1) non-3-enes of the formula



formula III

which comprises reacting a compound of the formula



formula II

at a temperature of about 30° C. to about 150° C. for a period of about 0.5 to about 48 hours in the presence of a Lewis acid selected from the group consisting of $AlCl_3$, $ZnCl_2$, $FeCl_3$, BF_3, $SnCl_4$, NH_4I, NH_4Br, NH_4Cl, NH_4acetate and acetic acid, where R is alkyl or aralkyl having up to 30 carbon atoms.

4,490,294

PURE SALTS OF CLAVULANIC ACID, E.G. LITHIUM CLAVULANATE

Ian D. Fleming, Chalfont St. Peter; David Noble; Hazel M. Noble, both of Marlow, and Wilfred F. Wall, High Wycombe, all of England, assignors to Beecham Group p.l.c., Brentford, England

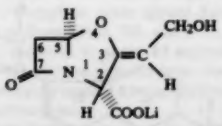
Continuation of Ser. No. 654,638, Feb. 2, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,496

Claims priority, application United Kingdom, Feb. 7, 1975, 5409/75; Mar. 17, 1975, 11076/75

Int. Cl.³ C07D *498/04*; A61K *31/42*

U.S. Cl. 260—245.3 **1 Claim**

1. Lithium clavulanate of the formula



having a molar extinction coefficient as determined in 0.1M aqueous sodium hydroxide using ultraviolet light of wavelength 258 mm of at least about 16510.

4,490,295

PURE SODIUM SALT OF CLAVULANIC ACID

Ian D. Fleming, Chalfont St. Peter; David Noble; Hazel M. Noble (formerly Gillett), both of Marlow, and Wilfred F. Wall, High Wycombe, all of England, assignors to Beecham Group p.l.c., Brentford, England

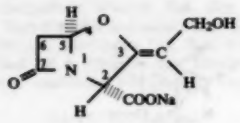
Division of Ser. No. 888,496, Mar. 20, 1978, , which is a continuation of Ser. No. 654,638, Feb. 2, 1976, abandoned. This application May 7, 1980, Ser. No. 147,584

Claims priority, application United Kingdom, Feb. 7, 1975, 5409/75; Mar. 17, 1975, 11076/75

Int. Cl.³ C07D 498/04; A61K 31/42

U.S. Cl. 260—245.3 **1 Claim**

1. Sodium clavulanate of the formula



having a molar extinction coefficient as determined in 0.1M aqueous sodium hydroxide using ultraviolet light of wavelength 258 nm of at least about 15760.

4,490,296

COMPOSITIONS AND METHOD

Derek H. R. Barton; William B. Motherwell, and Samir Z. Zard, all of Gif-Sur-Yvette, France, assignors to Roussel Uclaf, Paris, France

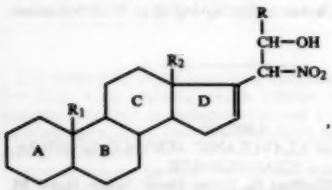
Filed Jan. 31, 1983, Ser. No. 462,684

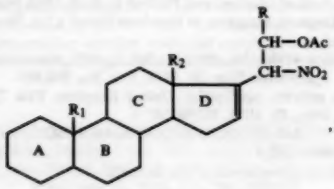
Claims priority, application France, Feb. 18, 1982, 82 02681

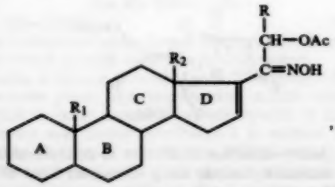
Int. Cl.³ C07J 5/00

U.S. Cl. 260—397.4 **17 Claims**

17. A compound having a formula selected from the group consisting of







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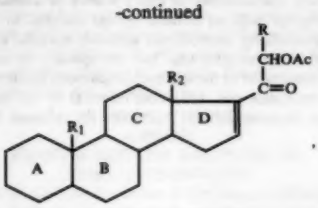
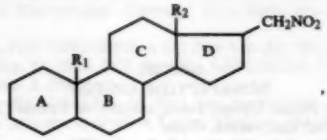
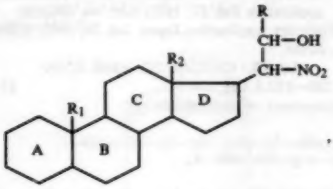
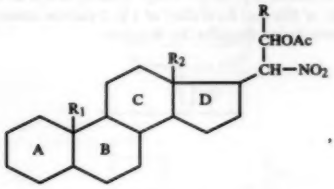
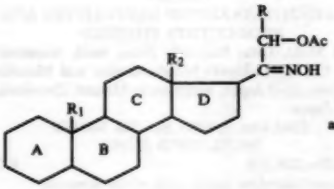


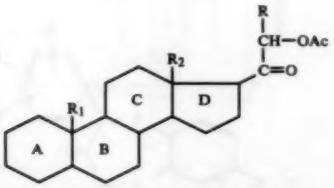








and



wherein R_1 is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms optionally substituted with an oxygen or nitrogen group or halogen and alkenyl and alkynyl of of 2 to 4 carbon atoms, R_2 is alkyl of 1 to 4 carbon atoms and the A,B,C and D rings optionally contain at least one double bond and optionally substituted with at least one member of the group consisting of —OH, =O, halogen, alkyl and alkoxy of 1 to 4 carbon atoms and alkenyl and alkynyl of 2 to 4 carbon atoms, Ac is acyl of 1 to 18 carbon atoms and R is selected

from the group consisting of hydrogen and alkyl of 1 to 18 carbon atoms.

4,490,297
METHOD FOR THE RECOVERY AND REUSE OF COBALT AND/OR MANGANESE COMPONENTS OF CATALYSTS

Marcel Feld, Cologne, and Günter Zoche, Bonn-Beuel, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Filed Dec. 21, 1982, Ser. No. 451,908
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151383
Int. Cl.³ C07F 13/00, 5/06
U.S. Cl. 260—429 R 14 Claims

1. A process for the recovery of spent cobalt and/or manganese catalyst used for the air oxidation of alkyl aromatics in acetic acid solution wherein cobalt and/or manganese catalyst metals are precipitated from the acetic acid as acetic acid insoluble cobalt and/or manganese oxalate dihydrate salts; comprising the conversion of the insoluble oxalate dihydrate salts into an acetic acid soluble form by reaction with acetyl bromide, hydrogen bromide or a mixture thereof in acetic acid or acetic anhydride.

4,490,298
METHOD OF ISOLATING COBALT AND/OR MANGANESE AS OXALATES

Marcel Feld, Cologne, Fed. Rep. of Germany, assignor to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 462,862
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204510
Int. Cl.³ C07F 11/00, 15/06
U.S. Cl. 260—429 R 14 Claims

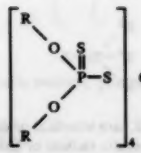
1. A process for the recovery of cobalt and/or manganese in the form of precipitated, easily filtrable cobalt and/or manganese oxalates from solutions of cobalt and/or manganese compounds in aliphatic carboxylic acids, water or mixtures thereof and which may contain other heavy metal compounds, inorganic and organic substances, comprising mixing the solutions with oxalic esters at temperatures from about 50° to 250° C. and separating the cobalt and/or manganese oxalate by a solid-from-liquid separation method.

4,490,299
GERMANIUM DITHIOPHOSPHATE

Brent J. Bertus, and Dwight L. McKay, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 449,319, Dec. 13, 1982, , which is a division of Ser. No. 276,402, Jun. 22, 1981, Pat. No. 4,386,015, which is a division of Ser. No. 139,483, Apr. 11, 1980, Pat. No. 4,334,979.
This application Sep. 13, 1983, Ser. No. 531,567
Int. Cl.³ C07F 7/30
U.S. Cl. 260—429 R 2 Claims

1. A composition represented by the formula



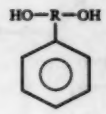
wherein R is alkyl having from 1 to about 6 carbon atoms.

4,490,300
LIQUID DIPHENYLMETHANE DIISOCYANATE COMPOSITIONS

Gary F. Allen, and Richard S. Pantone, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 30, 1983, Ser. No. 538,054
Int. Cl.³ C07C 69/00, 125/06
U.S. Cl. 260—453 SP 9 Claims

1. A process for the production of an isocyanate which is both stable and liquid at room temperature comprising reacting pure diphenylmethane diisocyanate or crude diphenylmethane diisocyanate with a diol of the formula,



wherein R is a C_2 to C_5 aliphatic radical, at a temperature of from 20° to 110° C., in a ratio such that the resultant product has an isocyanate group content of from 20 to 30%, by weight.

4,490,301
LIQUID DIPHENYLMETHANE DIISOCYANATE COMPOSITIONS

Richard S. Pantone, New Martinsville, W. Va., and Helmut F. Reiff, Leverkusen, Fed. Rep. of Germany, assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 30, 1983, Ser. No. 538,055
Int. Cl.³ C07C 69/00, 125/06
U.S. Cl. 260—453 SP 7 Claims

1. A process for the production of an isocyanate which is both stable and liquid at room temperature comprising reacting pure diphenylmethane diisocyanate or crude diphenylmethane diisocyanate with the monoallyl ether of trimethylolpropane at a temperature of from 20° to 110° C., in such a ratio that the resultant product has an isocyanate group content of from 20 to 30%, by weight.

4,490,302
LIQUID DIPHENYLMETHANE DIISOCYANATE COMPOSITIONS

Eric C. Ma, New Martinsville, and James N. Rieck, Wheeling, both of W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Nov. 25, 1983, Ser. No. 554,880
Int. Cl.³ C07C 69/00, 125/06
U.S. Cl. 260—453 AM 7 Claims

1. A liquid, diphenylmethane diisocyanate composition having an isocyanate functionality of greater than 2.0 and having an isocyanate group content of from about 20 to about 30 percent by weight prepared by reacting:

(a) diphenylmethane diisocyanate with

(b) a mixture of

(i) from about 5 to about 20 equivalent percent of a monohydroxy alcohol,

(ii) from about 25 to about 35 equivalent percent of a poly-1,2-propylene ether glycol having a molecular weight of from 134 to 700, and

(iii) from about 45 to about 65 equivalent percent of a trihydroxy alcohol selected from the group consisting of trimethylolpropane, triethylolpropane, glycerine and 1,3,6-hexane triol,

the total equivalent percent of (i), (ii) and (iii) being 100 parts,

the weight ratio of (a) to (b) being from 5:1 to 15:1.

4,490,303

IMINO ETHERS

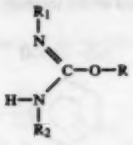
Richard T. Dean, Fanwood; Conrad P. Dorn, Jr., Plainfield, and Tsung-Ying Shen, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 270,422, Jun. 4, 1981, abandoned, which is a division of Ser. No. 145,173, Apr. 30, 1980, Pat. No. 4,304,720. This application Sep. 23, 1982, Ser. No. 421,751

Int. Cl.³ C07C *83/02, 119/18*

U.S. Cl. 260—453.99 7 Claims

1. A compound having the formula:



wherein R is an alkenyl group of from 12 to 30 carbon atoms with one double-bond in this cis configuration and R^1 and R^2 are independently loweralkyl of from 1 to 6 carbon atoms or cycloalkyl of 4 to 6 carbon atoms.

4,490,304

PERFLUOROALKYL THIOALKYLENE AMPHOTERIC COMPOUNDS

Robert A. Falk, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,211

Int. Cl.³ C07C *141/02, 141/16, 143/14, 101/02*

U.S. Cl. 260—457 3 Claims

1. A perfluoroalkyl thioalkylene amphoteric compound of the formula

$$R_f\text{—}R_1\text{—}SCH_2CR_2(OH)CHR_3NR_4R_5Z$$

R_f is straight or branched chain perfluoroalkyl of 6 to 12 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 atoms;

R_1 is branched or straight chain alkylene of 2 to 8 carbon atoms, alkylenethioalkylene of 2 to 8 carbon atoms, alkyleneoxyalkylene of 2 to 8 carbon atoms or alkyleneiminoalkylene of 2 to 8 carbon atoms where the nitrogen atom contains hydrogen or alkyl of 1 to 6 carbon atoms as a third substituent;

R_2 and R_3 are independently hydrogen or lower alkyl from 1 to 6 carbon atoms, lower alkoxyalkyl, halo loweralkyl, cycloalkyl of 5 or 6 carbons and alkenyl of up to 6 carbon atoms;

R_4 and R_5 are independently hydrogen or straight or branched chain alkyl of 1 to 12 carbon atoms or phenyl which are unsubstituted or substituted by carboxy, sulfo, sulfato, phosphoro or phosphono; and

Z is straight or branched chain alkylene of 1 to 12 carbon atoms which is substituted by carboxy, sulfo, sulfato, phosphoro, or phosphono, or thiosulfato and the acid adduct, alkaline salt, or N-lower alkyl or N-benzyl quaternary ammonium salts thereof.

4,490,305

LIQUID-CRYSTALLINE HALOGEN COMPOUNDS, PROCESS FOR THEIR PREPARATION, DIELECTRICS CONTAINING THESE, AND ELECTRO-OPTICAL DISPLAY ELEMENT

Rudolf Eidenschink, Dieburg; Michael Römer, Rodgau, and Georg Weber, Erzhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

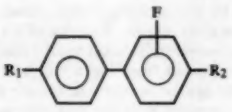
Filed Sep. 15, 1982, Ser. No. 418,360

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136624

Int. Cl.³ G02F *1/13;* C09K *3/34;* C07C *25/18, 43/22, 121/64*

U.S. Cl. 260—465 F 3 Claims

1. A liquid-crystalline halogen compound of the formula



wherein R_1 is alkyl or alkoxy each of 1 to 12 carbon atoms or cyano; and R_2 is alkyl or alkoxy each of 1 to 12 carbon atoms; with the proviso that R_1 and R_2 are not simultaneously methyl.

4,490,306

PREPARATION OF SULFONAMIDES

Rolf-Dieter Acker, Leimen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

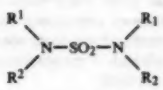
Filed Jan. 17, 1983, Ser. No. 458,636

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204168

Int. Cl.³ C07C *143/86*

U.S. Cl. 260—465 E 16 Claims

1. A process for the preparation of a sulfonamide of the formula



I

wherein the individual radicals R^1 and R^2 are identical or different and are each an aliphatic, cycloaliphatic, araliphatic or aromatic radical or hydrogen, by reacting a sulfonyl halide with a nitrogen compound, wherein

(a) ammonia or an amine of the formula

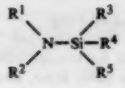
II

where R^1 and R^2 have the above meanings, is reacted with a halosilane of the formala

III

where R^3, R^4 and R^5 are identical or different and are each an aliphatic or aromatic radical or halogen, and X is halogen, and

(b) the resulting silylamine of the formula



IV

where R^1, R^2, R^3, R^4 and R^5 have the above meanings, is reacted with sulfuryl chloride in the presence of a solvent which is inert under the reaction conditions.

4,490,307

PROCESS FOR THE PRODUCTION OF β-MERCAPTOPROPIONIC ACID DERIVATIVES

Herbert Klenk, Hanau, Fed. Rep. of Germany, assignor to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 15, 1983, Ser. No. 504,422

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1982, 3223973

Int. Cl.³ C07C *121/16, 149/20, 149/237*

U.S. Cl. 260—465.1 **22 Claims**

1. A process for the production of a β-mercaptopropionic acid derivative of formula (I)

$$H—S—CH_2—CH_2—X \qquad (I),$$

where X is —CN, —COOH, or —COOR where R is an alkyl group having 1 to 18 carbon atoms comprising reacting an acrylic acid derivative of the formula (II)

$$CH_2=CH—X \qquad (II)$$

with an alkaline earth metal disalt of trithiocarbonic acid, alkali metal disalt of trithiocarbonic acid, or ammonium disalt of trithiocarbonic acid in a solvent which is water alone or a mixture of water and an organic solvent, acidifying the reaction mixture obtained with a protonic acid and recovering the β-mercaptopropionic acid derivative of formula (I).

4,490,308

NEW WATER-SOLUBLE SULFONATED MONOMERS

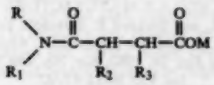
Dodd W. Fong, Naperville, and David J. Kowalski, LaGrange Park, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jun. 30, 1983, Ser. No. 509,549

Int. Cl.³ C07C *143/12*; C08F *28/02*

U.S. Cl. 260—513 N **8 Claims**

1. An anionic monomer capable of homopolymerization and copolymerization which is represented by the general formula:



wherein:

M is hydrogen, lithium, sodium, potassium, magnesium, or calcium;

R is allyl;

R_1 is hydrogen or allyl;

R_2 is hydrogen or sulfonato;

R_3 is hydrogen or sulfonato; and providing that R_2 is not the same as R_3.

4,490,309

INTEGRATED FUEL CONTROL SYSTEM FOR GASOLINE ENGINE

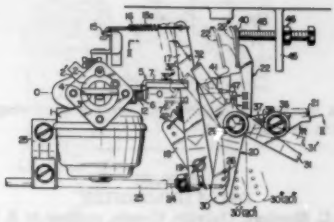
Tetsuzo Fujikawa, Kobe; Makizo Hirata, and Shinichi Tamba, both of Kakogawa, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1983, Ser. No. 532,966

Claims priority, application Japan, Sep. 21, 1982, 57-165295

Int. Cl.³ F02M *1/02*

U.S. Cl. 261—52 **1 Claim**



1. An integrated fuel control system for a gasoline engine, comprising:

a linkage for controlling a throttle valve and a choke valve of the gasoline engine in correlation with each other according to a single command operation performed by an operator,

said linkage being composed of a plurality of pivotable members operatively associated with one another in such a manner that as one of said pivotable members is actuated by the operator, the rest of the pivotable members are maintained in engagement with said one pivotable member either continuously or intermittently,

said one pivotable member operated by the operator having a full power position and a choking position at opposite ends of the range of movement thereof, and an idling position midway between said two end positions,

said linkage being so adapted to successively open the throttle valve when said one pivotable member is moved from the idling position to the full power position, while to successively close the choke valve and successively open the throttle valve up to a partly open position when said one pivotable member is moved from the idling position to the choke position.

4,490,310

PROCESS FOR CONTACTING GAS AND LIQUID AS WELL AS PACKING FOR THE APPLICATION OF THIS PROCESS

Andrzej Plaskura; Ignacy Lachman; Tadeusz Byrka, all of Gliwice; Zbigniew Leszczyński, Warsaw; Krzysztof Rogalski, Warsaw; Marta Koch, Warsaw, and Józef Zyczyński, Warsaw, all of Poland, assignors to Biuro Projektow i Realizacji Inwestycji Przemysłu Syntezy Chemicznej "Prosynchem", Gliwice, Poland

Filed Jul. 19, 1982, Ser. No. 399,919

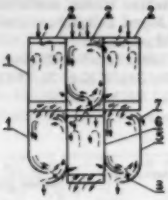
Claims priority, application Poland, Jul. 29, 1981, 232397

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—79 A **4 Claims**

1. A packing for contacting gas and liquid in a counter-current column comprising layers composed of reproducible elements of regular polygonal section, each of which has a lower part shaped to form a nozzle by overlapping of two opposite walls of the element, which walls form at the same time slits between themselves and the other walls, and wherein the nozzle is placed so as to direct the gas upon a vertical wall of the element, which wall has in an upper part an arcuate or

angular bend which increases the speed of said gas and liquid creating a vertical vortex motion in which the liquid and gas



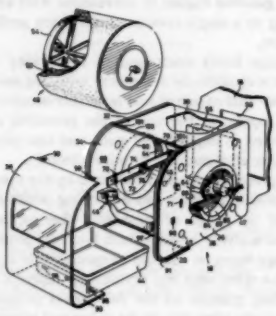
flows in the same direction and forms a narrowing of the element in the upper part.

4,490,311

DRUM HUMIDIFIER

Charles G. Shepherd, Oakville, Canada, assignor to B. D. Wait Co. Limited, Oakville, Canada

Filed Sep. 17, 1982, Ser. No. 419,262
Int. Cl.³ B01F 3/04
U.S. Cl. 261—92 18 Claims



1. A float valve assembly comprising: an inlet nozzle, a float mounted for pivotal movement vertically relative to said nozzle; and a sealing member carried by said float for movement therewith, said sealing member being rotatably mounted on said float and having a sealing surface engageable with said nozzle to control the flow of fluid therethrough, the sealing surface being eccentric to the axis of rotation of the sealing member whereby rotation of the sealing member relative to the float varies the relative angular disposition of the float and the nozzle and the float can be used to maintain water in a tray to depths selected from a range of depths dependant on the length of the sealing surface.

14. A humidifier comprising:

a housing having a top, a base, an open front, a rear wall defining an opening for passage of air through the housing, and a pair of parallel side walls defining a pair of similar circular apertures located in the regions of the side walls intersected by an axis of rotation lying perpendicular to the side walls,

the side walls including similar outwardly extending cylindrical flanges surrounding the apertures and attachment means on both side walls;

a door adapted to close the front;

a cap mounted on one of the flanges on the side walls to cover the corresponding aperture formed in the side wall;

a bracket having a bearing member, the bracket being mounted detachably in a horizontal orientation on one of said side walls by said attachment means, and having an upwardly opening U-shaped bearing on said horizontal axis;

motor means attached to said cap;

a drum having a water absorbant outer layer and a central axle lying about said horizontal axis and having ends extending beyond the outer layer, one of the ends being supported by and drivably coupled to the motor and the other of said ends resting in said bearing to support the drum for rotation by the motor about the horizontal axis so that in use air can be forced to move between the opening in the rear wall and the aperture in the side wall selected to carry the bracket;

a water reservoir resting on the base to carry water to a level where part of the water absorbent outer layer of the drum is immersed in the water; and

a float valve attached to one of the side walls to control the level of water in the reservoir.

4,490,312

COOLING TOWER WITH INTERLOCKING TILES

Dale D. Furr, Arlington, Tex., assignor to Ceramic Cooling Tower Company, Fort Worth, Tex.

Filed Aug. 19, 1982, Ser. No. 409,541
Int. Cl.³ B01F 3/04
U.S. Cl. 261—98 7 Claims

1. In a cooling tower having a side wall providing a cooling enclosure, tile support means within said enclosure for supporting a plurality of open-celled tiles, and liquid distribution means for supplying liquid to be cooled to said enclosure, the improvement comprising a plurality of layers of open-celled tiles stacked above the tile support means and supported thereby, each of said tiles including a side wall which extends around the tile and a plurality of intersecting partitions inside the side wall which provide a plurality of generally rectangular cells, the side wall providing a first corner around two sides of a first cell and a second corner around two sides of a second cell, the side wall extending inwardly along two sides of a third cell to provide a first recessed portion and extending inwardly along two sides of a fourth cell to provide a second recessed portion, the recessed portions and the corners being complementarily shaped so that each projecting portion of one tile can be inserted into a recessed portion of an adjacent tile whereby the tiles of each of said layers are interlocked and lateral relative movement of the tiles is restrained.

4,490,313

CAPSULE MANUFACTURE

Robert W. Brown, and Richard P. Bowman, both of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed Jan. 24, 1983, Ser. No. 460,704
Int. Cl.³ B01J 13/02
U.S. Cl. 264—4.7 12 Claims

1. A process for preparing microcapsules in an aqueous manufacturing vehicle which comprises enwrapping particles of intended capsule core material, substantially insoluble in said vehicle, with polymeric shells produced by in situ polymerization of melamine and formaldehyde, methylol melamine, methylated methylol melamine, urea and formaldehyde, dimethylol urea or methylated dimethylol urea in the presence of a mixture of poly(acrylic acid) and polystyrene sulfonic acid

or a salt thereof, wherein said mixture is present as about 0.75 to about 10 percent, by weight, of the aqueous maufacturing vehicle and said polystyrene sulfonic acid or salt is present in an amount of about 6 to about 50 percent by weight based on the weight of said mixture.

4,490,314

RADIATION CURED SILICONE RUBBER ARTICLES

John G. DuPont, Reading, Mass., and Paul A. Goodwin, Amherst, N.H., assignors to High Voltage Engineering Corporation, Burlington, Mass.

Division of Ser. No. 211,252, Nov. 28, 1980, Pat. No. 4,362,674. This application Sep. 30, 1982, Ser. No. 431,561

The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.

Int. Cl.³ B29C *25/00*

U.S. Cl. 264—22 **1 Claim**

1. An irradiated silicone rubber article produced in accordance with the following process:

(a) forming into a desired shape a mixture of (i) silicone gum which includes a substantial amount of one or more hydroxyl-terminated polydimethylsiloxanes having a molecular weight from about 50,000 to about 2,000,000 and in which some of the methyl groups may have been replaced by other organic aliphatic, aromatic, or cycloaliphatic radicals such as ethyl, vinyl, allyl, phenyl, or halogenated radicals of the foregoing types, and (ii) about 10 to about 70 parts per hundred of rubber of a finely divided silica filler with a particle size in the reinforcing range:

(b) treating the mixture so formed with a precuring agent selected from the group consisting of ammonia gas, ammonium hydroxide, vapors of a volatile amine, or a solution of a volatile amine; and

(c) irradiating with high energy ionizing radiation the precured shape.

4,490,315

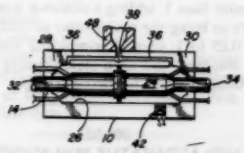
METHODS OF MOULDING OF PLASTICS ARTICLES

Leonard J. Charlebois, and Fred A. Huszarik, both of Kanata, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 345,774, Feb. 4, 1982, abandoned. This application Oct. 31, 1983, Ser. No. 547,422

Int. Cl.³ B29C *6/00*; B29F *1/00*

U.S. Cl. 264—40.1 **1 Claim**



1. A method of moulding an article in the form of an encapsulation around an object which is deformable or crushable under a certain compressive load, comprising causing molten plastics material to flow at a low pressure into a mould cavity containing the object and, during filling, causing the material to extend across and bridge an open passage extending from the cavity and permitting the commencement of formation of a skin on the material bridging the passage, said skin being thinner than skin contacting surfaces of the mould, and filling the cavity to effect an increase in pressure in the molten material, which pressure is below that required to deform or crush the object but is sufficient to cause rupture of said thinner skin and to force a flow of the molten material along the passage to a switch operating location and operate a switch to cease futher flow of material into the mould.

4,490,316

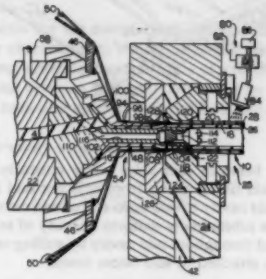
APPARATUS AND METHOD FOR CONTROLLING INTERNAL SIZE OF AN EXTRUDED HOSE

Ronald L. Satzler, Princeville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 29, 1983, Ser. No. 508,998

Int. Cl.³ B29D *23/04, 23/05*; B65H *81/00*

U.S. Cl. 264—40.7 **18 Claims**



1. A method of manufacturing an elastomeric hose (10,26), comprising the steps of:

extruding with internal and external shaping members an elastomeric hose (10,26) having a predetermined internal size as defined by an inner peripheral surface;

defining an optimum orifice size between the inner peripheral surface of the extruded hose (10) and a fluid gauge means (54) located within the extruded hose (10) and forming an integral part of the internal shaping member;

continuously monitoring the orifice size with the fluid gauge means (54); and

controlling the rate of extrusion in response to a change in the orifice size from a predetermined size range.

5. In an apparatus (12) for controlling the internal size of an extruded elastomeric member (10), said apparatus (12) including an extruder (22) and die mechanism (25) for continuously forming the extruded member, the die having internal and external shaping members (102,118), the improvement comprising:

fluid gauge means (54) for continuously monitoring the internal size of the extruded member (10) as defined by an inner peripheral surface, the fluid gauge means (54) is located within the extruded member and forms an integral part of the internal shaping member (102), an optimum orifice size is defined between the fluid gauge means (54) and the inner peripheral surface of the extruded member (10); and

control means (32) for controlling the speed of the extruder (22) in response to a change in the orifice size from a predetermined size range.

4,490,317

METHOD AND APPARATUS FOR MANUFACTURING STRESS-SKIN PANELS

Aron Kliewer, Lake Arrowhead, Calif., assignor to Fleetwood Enterprises, Inc., Riverside, Calif.

Filed Jun. 12, 1980, Ser. No. 158,928

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—46.5 **9 Claims**

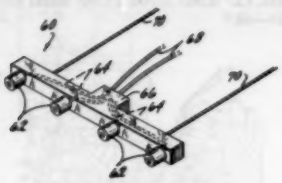
1. A process for forming a stress-skin panel which comprises:

holding the two skins of the panel to be manufactured against spaced mold surfaces,

enclosing adjacent side edges and adjacent ends of said mold surfaces so as to form a cavity having closed sides, a closed end and an open end,

locating a filling means comprising an elongated boom within said cavity adjacent to said closed end,

concurrently supplying reactable liquid ingredients capable of forming a rigid porous core between said skins to said filling means, thereafter mixing said ingredients, and conveying the mixed ingredients into said cavity from said filling means in a substantially uniform manner along a line



extending between said sides while concurrently withdrawing said filling means from adjacent said closed end through said cavity to said open end of said cavity at a rate such that a substantially uniform quantity of said mixture is deposited throughout said cavity by pulling on a flexible line means attached to said boom means.

4,490,318

SEMICONDUCTIVE CERAMIC MATERIALS WITH A VOLTAGE-DEPENDENT NONLINEAR RESISTANCE, AND PROCESS FOR PREPARATION

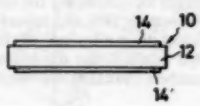
Masaru Masuyama, Gunma; Susumu Hirooka, Takasaki, and Nobutatsu Yamaoka, Gunma, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Division of Ser. No. 441,219, Nov. 12, 1982, Pat. No. 4438214. This application Dec. 16, 1983, Ser. No. 562,429

Claims priority, application Japan, Nov. 26, 1981, 56-18959

Int. Cl.³ C04B *35/46*

U.S. Cl. 264—61 **8 Claims**



1. A process for fabricating bodies of a semiconductive ceramic material with a voltage-dependent nonlinear resistance, which comprises providing a mixture of 100 mole parts of $Sr_{(1-x)}Ca_xTiO_3$ in finely divided form, where x is a numeral from about 0.01 to about 0.50, from about 0.01 to about 3.00 mole parts of at least one metal oxide in finely divided form selected from the group consisting of Nb_2O_5, Ta_2O_5, WO_3, La_2O_3, CeO_2, Nd_2O_3, Y_2O_3, Sm_2O_3, Pr_6O_{11} and Dy_2O_3, and an organic binder, forming the mixture into moldings of desired shape and size, firing the moldings in a temperature range from about 1300° C. to about 1500° C. in a nonoxidative atmosphere, refiring thee moldings in a temperature range from about 850° C. to about 1350° C. in an oxidative atmosphere to complete ceramic bodies, and adding from about 0.02 to about 2.50 mole parts of Na_2O to the ceramic bodies not later than the refiring of the moldings.

4,490,319

RAPID RATE SINTERING OF CERAMICS

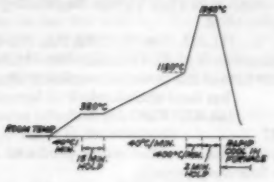
Minyoung Lee; Marcus P. Borom, both of Schenectady, and Lawrence E. Szala, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 26, 1983, Ser. No. 545,706

Int. Cl.³ C04B *35/58*

U.S. Cl. 264—65 **50 Claims**

1. In the process for preparing multi-phase, substantially crystalline, sintered ceramic bodies in which a mixture of different powdered ceramic materials are consolidated under pressure to produce a pressed powder body of a preselected shape and volume, which unconfined pressed powder body is then heated in a furnace to a maximum sintering temperature and then permitted to cool, said mixture containing components that can chemically interact at elevated temperatures to inhibit densification or form phases undesirable for sintering, the improvement of employing a rapid heating rate in excess of about 100° C. per minute during at least that part of the heating



cycle in which said maximum sintering temperature is reached and holding at said maximum: temperature for a period of time long enough to achieve uniform temperature distribution throughout said pressed powder body, said heating rate being rapid enough to densify said pressed powder body at a rate exceeding the rate of chemical reaction of said components and recovering a sintered body having a density of at least 94% theoretical and being free of any interconnected network of pores.

4,490,320

PROCESS FOR PREPARING A CALCIUM SILICATE SHAPED PRODUCT

Yasuo Oguri, Tokyo; Mitsuru Awata, Kodaira; Junji Saito, Yokohama; Soichi Inoue, Kawasaki, and Noriyuki Ariyama, Hino, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 454,174

Claims priority, application Japan, Jan. 27, 1982, 57-11307

Int. Cl.³ C04B *15/14*

U.S. Cl. 264—82 **15 Claims**

1. A process for preparing a calcium silicate shaped product, which comprises:

heat-reacting a calcareous source and a siliceous source dispersed in water to obtain an aqueous slurry containing a calcium silicate hydrate having a molar ratio of CaO/SiO_2 greater than 1; adding a siliceous source to the aqueous slurry to bring the molar ratio of CaO/SiO_2 to a level of from 0.85 to 1; pressfilter-molding the aqueous slurry thereby obtained, and then steam-curing and drying the object obtained from the molding step.

4,490,321

METHOD AND APPARATUS FOR MANUFACTURING FILTER PLATES OR THE LIKE

Werner Klinkau , Berg am Starnbergersee, Fed. Rep. of Germany, assignor to Klinkau & Co. GmbH, Fed. Rep. of Germany

Filed Dec. 16, 1982, Ser. No. 450,344

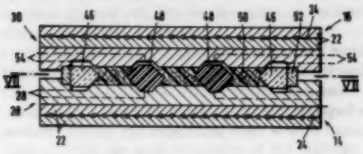
Int. Cl.³ B29J *5/00*

U.S. Cl. 264—109 **7 Claims**

1. In a method of manufacturing plates comprising a sealed edge and a planar central region from thermoplastic synthetic material by compression molding, in which the synthetic material is placed between upper and lower parts of a mold, heated under pressure in a press frame and then cooled such that cooling essentially occurs from the outer mold surfaces, the improvement therein for making plates having areas of unequal thickness, comprising the steps of:

with an open mold, inserting a thermally-insulating compressible edge strip;

inserting a prefabricated frame of solid synthetic material generally defining the periphery of the plate within the edge strip and between the upper and lower parts of the mold before heating under pressure;



filling the remaining area of the mold with particles of the synthetic material; and

closing the mold to engage the edge strip before heating under pressure and cooling under pressure.

4,490,322

PROCESS FOR PRODUCING FILM

Bernd Zierenberg, Ingelheim am Rhein, Fed. Rep. of Germany, assignor to Boehringer Ingelheim K.G., Ingelheim am Rhein, Fed. Rep. of Germany

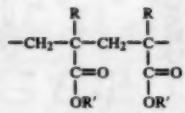
Filed Feb. 3, 1983, Ser. No. 463,589

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204551

Int. Cl.³ D01F 6/00; A61M 37/00; A61K 9/00

U.S. Cl. 264—205 **5 Claims**

1. A process for the preparation of a pharmaceutical composition in the form of a polyacrylate film for long-term transdermal administration of systemic pharmaceuticals, which comprises forming a homogeneous solution of an effective amount of a systemically acting pharmaceutical and a freeze-dried latex of a polyacrylate copolymer having a polymer unit of the formula



where

R is H or CH_3 and

R' is CH_3 or C_2H_5

formed by emulsion polymerization and having an average molecular weight of about 800,000 in an organic solvent, forming a thin layer of the said solution, and drying the layer to form a polyacrylate film.

4,490,323

INCORPORATION OF LIQUID ADDITIVES INTO POLYMERIC FILMS

Bruce J. Thomson, Epping, Australia, assignor to Union Carbide Australia, Limited, Sydney, Australia

Filed Mar. 4, 1983, Ser. No. 472,134

Int. Cl.³ D01F 1/02

U.S. Cl. 264—211 **10 Claims**

1. In a process for the addition of liquid additives in the manufacture of thermoplastic polymeric film wherein solid film resin is advanced to a melt zone to form a melted resin, which is extruded through a die to form the film, the improvement comprising blending a liquid additive with a free flowing granular masterbatch resin which is compatible with the film resin and which has a particle size between about 0.2 millimeters and about 1.5 millimeters, to form a masterbatch concentrate, and mixing the masterbatch concentrate with the solid film resin before advancement to the melt zone.

4,490,324

NYLON FILM WITH IMPROVED SLIP CHARACTERISTICS AND PROCESS THEREFOR

Alistair N. Mollison, Kingston, Canada, assignor to Du Pont Canada Inc., Montreal, Canada

Division of Ser. No. 488,447, Apr. 25, 1983, abandoned. This application May 2, 1984, Ser. No. 606,401

Claims priority, application Canada, Jun. 29, 1982, 406215

Int. Cl.³ B29C 25/00; C08J 7/08; C08K 5/20; C08L 77/00

U.S. Cl. 264—211 **2 Claims**

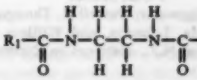
1. A process for the manufacture of nylon film having improved slip characteristics which comprises the steps of

(a) forming a homogeneous mixture of a film-forming nylon resin and between 0.05 and 1.0 percent by weight of the nylon resin of a material selected from the group consisting of

(1) secondary amides of the formula

and

(2) N, N' ethylene bis amides of the formula



where R_1 and R_2 aliphatic hydrocarbon chains of C_{14}–C_{22}; and

(b) melt extruding the mixture into film,

(c) and thereafter heating the film to a temperature between 40° C. and 150° C. for a period of from 2 to 30 minutes.

4,490,325

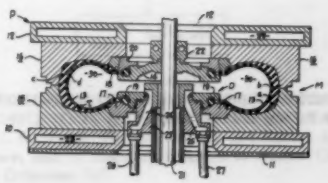
PROCESS FOR MULTI-STAGE DEAD-END-WATER TIRE CURING

William F. Mattson, Hinckley, and Dennis L. Trapp, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 31, 1983, Ser. No. 528,190

Int. Cl.³ B29H 5/01

U.S. Cl. 264—315 **9 Claims**



1. In a process for vulcanizing a rubber tire in a closed mold having a generally toroidal mold cavity and an extensible curing bladder wherein a green tire is expanded in the mold by supplying a pressure fluid to the bladder and exterior portions of the tire are heated by supplying heat to the closed mold during a pressure-curing period sufficient to vulcanize the tire, a multistage process comprising,

(a) in a first stage with flow from the bladder cutoff, supplying high-pressure steam to the bladder at a pressure of at least 250 psig to heat said bladder and to shape the tire, said steam being provided in the bladder for about 10 to 40 percent of said pressure-curing period;

(b) in a second stage while flow from the bladder remains cutoff, supplying water to the bladder at a pressure of at

least 280 psig and maintaining the water for about 20 to 60 percent of said pressure-curing period;

(c) in a third stage, expelling water from the bladder with high-pressure steam and continuing to provide steam in the bladder for about 25 to 60 percent of said pressure-curing period so that the fluid pressure applied to the bladder during said pressure-curing period is from 250 psig to 450 psig for at least one-third of said pressure-curing period to effect thorough diffusion of air; and

(d) releasing pressure and removing water and steam from the bladder to permit opening the mold.

4,490,326

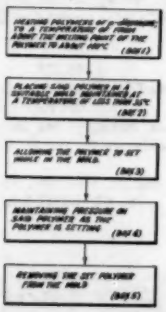
MOLDING PROCESS FOR POLYDIOXANONE POLYMERS

Howard Beroff, Bridgewater; Darrell R. Thompson, Somerville; Robert W. Mericle, Lebanon, and William C. Travis, Jr., Bound Brook, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

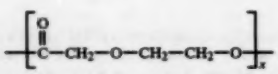
Continuation-in-part of Ser. No. 288,274, Jul. 30, 1981, abandoned. This application Oct. 6, 1982, Ser. No. 433,177

Int. Cl.³ B29F *1/06, 1/08;* A61B *17/08, 17/12*

U.S. Cl. 264—328.16 **11 Claims**



1. A method of producing a molded surgical device from polymers having units of the formula:



wherein x is the degree of polymerization resulting in a high molecular weight moldable polymer, said polymer having an inherent viscosity of at least 0.50 measured as a 0.1% solution in tetrachloroethane at 25° C. and a crystallinity of at least 20% as determined by X-ray diffraction comprising:

(a) heating the polymer to a temperature of from about the melt temperature of the polymer to about 140° C.:

(b) injecting said heated polymer in a mold, said mold being maintained at a temperature of 35° C. or less;

(c) allowing said polymer to harden sufficient to maintain its shape while in the mold; and

(d) removing said hardened polymer from the mold.

4,490,327

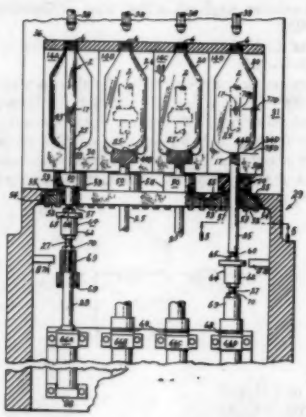
EXTERNAL CENTER PIN FOR BLOW MOLDING MACHINE

James W. Calvert, and Samuel Belcher, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 345,246, Feb. 3, 1982, Pat. No. 4,457,688. This application Dec. 12, 1983, Ser. No. 560,571

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—533 **8 Claims**



1. In a process for making a plastic container of thermoplastic resin by blow molding within a blow mold assembly being openable and comprising at least one mold which is openable, the steps comprising:

(a) assembling each openable mold to form along an axis a cavity shaped substantially like the container;

(b) suspending in the cavity an elongated tubular preform which is shorter than the container and which is open at one end and closed at the other end, the open end of the preform being held substantially on said axis by a neck ring which also cooperates with the blow mold assembly to seal the neck end of the cavity, there being no mechanical element which engages the interior bottom portion of the preform;

(c) inserting a blow plug;

(d) admitting blowing fluid into the preform through said blow plug;

(e) thereby expanding the preform along said axis and in a peripheral direction in a plane normal thereto, called the hoop direction, into engagement with the mold walls

defining the cavity to form the container, the improvement comprising the steps of:

(f) providing a reciprocative center pin movable along said axis within said cavity having a shaped upper face for engagement with the exterior closed end of the preform;

(g) positioning the upper face of the center pin in the cavity in close spaced relation to the exterior surface of the closed end of the preform;

(h) extending the preform along the axis of the mold by the blowing fluid force to position the exterior closed end of the preform against the shaped upper face; and

(i) maintaining the center pin substantially engaged with the preform during the expanding step, with a force insufficient to resist the axial expansion of the preform.

4,490,328

BOTTOM SHIELD FOR A GAS COOLED HIGH TEMPERATURE NUCLEAR REACTOR

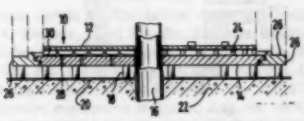
Josef Schoening, Hambruecken; Hans-Georg Schwiers, Ketsch; Claus Elter, Bad Durkheim; Wilfried Stracke, Oftersheim, and Hans-Juergen Kolodzey, Ketsch, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH., Cologne, Fed. Rep. of Germany

Filed Mar. 19, 1982, Ser. No. 359,838

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114480

Int. Cl.³ G21C *11/08*

U.S. Cl. 376—285 10 Claims



1. A gas cooled, high temperature nuclear reactor installation comprising:

a prestressed concrete pressure vessel having a reactor cavity;

a steel liner for said reactor cavity attached to said pressure vessel, said steel liner having a bottom member; and

a bottom shield mounted on said bottom member of said liner wherein said bottom shield comprises:

an upper circular plate formed from a plurality of interconnected upper plate members, said interconnected upper plate members being sector-shaped with overlapping radial portions, and secured together only within the inner half of the radius of said upper circular plate at said overlapping radial portions;

a lower circular plate disposed beneath said first circular plate formed from a plurality of interconnected lower plate members, said interconnected lower plate members being sector-shaped with overlapping radial portions and connected together only within the inner half of the radius of said lower circular plate at said overlapping radial portions;

first means for spacing said first plate from said second plate coaxially thereto; and

second means for spacing said second plate member above said bottom member of said liner.

4,490,329

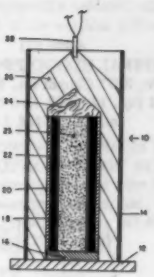
IMPLOSIVE CONSOLIDATION OF A PARTICLE MASS INCLUDING AMORPHOUS MATERIAL

Alan W. Hare, Port Angeles, Wash.; Lawrence E. Murr, Tigard, and F. Paul Carlson, Portland, both of Oreg., assignors to Oregon Graduate Center for Study and Research, Beaverton, Oreg.

Filed Sep. 3, 1983, Ser. No. 530,268

Int. Cl.³ B22F *1/00, 1/02*

U.S. Cl. 419—51 6 Claims



1. A method for the implosive consolidation, into a solid body, of a particulate mass comprising free amorphous particles, said method including the steps of

assembling such a mass to define, in the assembled but unconsolidated state, a chosen configuration for such a body,

imploding the assembled mass by an external, substantially surrounding explosive force in a manner bonding the particles in the mass as a unit to form a solid body having such chosen configuration, and

controlling said imploding in such a fashion that the contribution made to such body by such amorphous particles retains substantially the same amorphous characteristics as those exhibited by the unconsolidated amorphous particles.

4,490,330

SULPHUR DIOXIDE-LIBERATING, STERILIZING COMPOSITION AND METHOD OF USING SAME

John G. B. Howes, Hertford Heath, and Rupert A. Selway, Harlow, both of England, assignors to Anchor Continental Inc., Columbia, S.C.

Filed Feb. 8, 1983, Ser. No. 464,980

Claims priority, application United Kingdom, Feb. 12, 1982, 8204134

Int. Cl.³ A61L *13/00*; A01N *11/00*

U.S. Cl. 422—29 10 Claims

1. A composition capable of releasing sulphur dioxide in the presence of water, which comprises 2 to 20 parts by weight of hydroquinone and 0.5 to 10 parts by weight of thiourea per 100 parts by weight of a sulphur dioxide-liberating compound which is a metabisulphite said hydroquinone and said thiourea being operable to moderate the liberation of sulphur dioxide from said metabisulphite.

6. A method of sterilising an article which comprises bringing the article into contact with or into the proximity of an aqueous solution of a composition as claimed in claim 1

whereby the concentration of sulphur dioxide on the region of the article is at least 20 ppm.

4,490,331

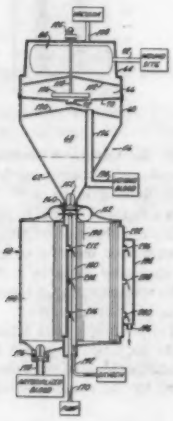
EXTRACORPOREAL BLOOD PROCESSING SYSTEM

Robert F. Steg, Jr., 8277 Chapin La., Sunland, Calif. 91040

Filed Feb. 12, 1982, Ser. No. 348,338

Int. Cl.³ A61M 1/03

U.S. Cl. 422—46 18 Claims



1. The method of priming and removing air from the blood chamber of a blood oxygenator of the type comprising a spiral tubular membrane of which the interior forms an oxygen flow chamber and including a blood flow chamber wherein blood flows between adjacent windings of the tubular membrane, said method comprising the steps of

filling said blood chamber with a priming liquid, drawing a vacuum within said spiral tubular membrane to at least partly collapse said membrane and enlarge the space between adjacent windings thereof, and

causing said priming liquid to flow into and out of said blood chamber in said blood paths between adjacent windings of said tubular membrane while maintaining a vacuum within said tubular membrane.

3. A mass transfer system comprising

a closed container,

mass transfer membrane means dividing said container into first and second chamber means,

valve means for passing blood into and out of said first chamber means,

means for passing a fluid into and out of said second chamber means,

a bladder pump having a sealed inflatable and collapsible membrane mounted completely within said first chamber means so as to be completely immersed in the blood therein, and

means for inflating and deflating said pump membrane within said first chamber means to drive blood from said first chamber means and to permit flow of blood into said first chamber means.

4,490,332

Patent Not Issued For This Number

4,490,333

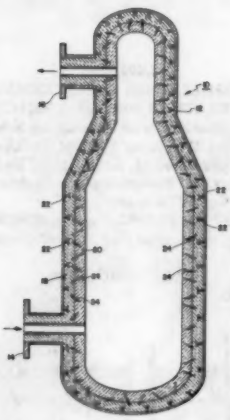
ANCHOR FOR REFRACTORY LINING

Michael J. Humphries, Ironia, and Edward B. Schumacher, Holmdel, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 28, 1982, Ser. No. 437,512

Int. Cl.³ B01J 19/02; F27D 1/10, 1/14

U.S. Cl. 422—241 8 Claims



1. An internally lined and insulated high temperature process vessel comprising:

a metallic shell, a plurality of metal anchor members welded to the interior wall of said shell, a gunned-on primary inner layer of low density insulating refractory material surrounding and covering all of said metal anchor members, a plurality of ceramic anchor members each having a reduced cross section area shaft portion merging into an enlarged tapered head portion, said shaft portion having a plurality of protruding serations at least some of which engage and penetrate partially into said low density insulating refractory material without contacting said metallic shell, and a secondary layer of higher density, high temperature resistant refractory material covering the enlarged head portions of said ceramic anchor members whereby said secondary layer of refractory material is secured to said metal shall solely by said high temperature corrosion resistant ceramic anchor members.

4,490,334

INSULATION OF DOMED REACTOR VESSELS

John R. Peterson, Randolph, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

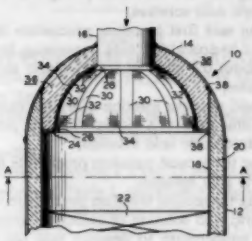
Filed Nov. 5, 1982, Ser. No. 439,380

Int. Cl.³ B01J 19/02, 3/00; F27D 1/00

U.S. Cl. 422—241 9 Claims

1. In an insulated and lined cylindrical pressure vessel having

at least one domed end portion, the improvement comprising an insulation support system, said system including an annular metallic stop plate secured to the inner lining of said cylindrical pressure vessel in the general region of the base of said domed end portion and projecting inwardly therefrom, conduit means communicating with the interior of said vessel and projecting inwardly through a central portion of said domed end portion, a concave ceramic fiber insulating blanket lining the interior surface of said end portion, said blanket contacting



and extending between said stop plate and said conduit means, and a plurality of spaced elongated arched rib members interior of said blanket, each said rib member being fixedly secured at its opposite ends respectively to the stop plate and said conduit means, each of said rib members being of such a length relative to the spacing between said stop plate and said conduit means so as to form a concave curved arch pressing against said insulating blanket and securing said blanket to the interior of said domed end portion.

4,490,335

APPARATUS FOR THE EXTRACTION OF WATER SOLUBLE SUBSTANCES FROM FRUIT AND VEGETABLE PRESSINGS AND VEGETABLE RAW MATERIALS

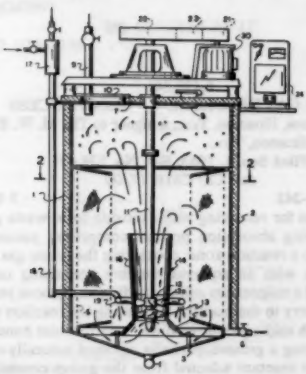
Kiril S. Marev; Hristo G. Krachanov; Anton A. Bratanov, and Nikolay A. Kirchev, all of Plovdiv, Bulgaria, assignors to Vi po Hranitelna I Vkusova Promishlenost, Plovdiv, Bulgaria

Division of Ser. No. 178,577, Aug. 15, 1980, Pat. No. 4,370,473. This application Jul. 30, 1982, Ser. No. 403,871

Claims priority, application Bulgaria, Aug. 16, 1979, 46895

Int. Cl.³ A23N *1/00*; B01D *11/02*; B01F *7/22*

U.S. Cl. 422—269 **5 Claims**



1. Apparatus for the extraction of a mass of fruit, vegetable pressings, or plant raw materials in a closed system, comprising a closed heat-insulated vessel with an internal draining wall, a driving unit having two driving speeds, a vertical shaft within the vessel driven by the driving unit, an impeller mounted on the lower end of the shaft, means for rectifying the material flow, an elongated vertical diffuser within which the impeller is disposed, the vessel having an imperforate side wall, and the internal draining wall of the vessel being in the form of a screen spaced inwardly from the imperforate wall of the vessel, and forming an annular draining chamber therewith, and comprising means for discharging liquid from the space between the imperforate wall and the internal draining wall thereof, the means for rectifying the material flow being disposed above the impeller in the vertical diffuser, and being in the form of a rectifying grid whereby the material driven upwardly by the impeller travels directly upwardly without substantially any spin within the upper part of the vertical diffuser.

4,490,336

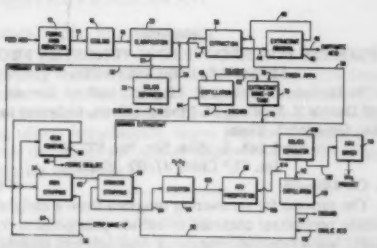
PROCESS FOR STRIPPING URANIUM FROM AN ALKYL PYROPHOSPHORIC ACID

Ralph E. Worthington, Winter Haven, and Alex Magdics, Lakeland, both of Fla., assignors to Prodeco, Inc., Mulberry, Fla.

Filed May 27, 1981, Ser. No. 267,473

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—10 **23 Claims**



1. A process for stripping uranium from a pregnant organic extractant comprising an extractant having a high affinity for tetravalent uranium dissolved in a substantially water-immiscible organic diluent, said organic extractant containing tetravalent uranium, comprising stripping said organic extractant with a stripping solution comprising an aqueous solution of an alkali metal or ammonium oxalate to strip tetravalent uranium from said organic extractant into said stripping solution, and separating said organic extractant from said stripping solution containing stripped tetravalent uranium.

4,490,337

PREPARATION OF CUPRIC HYDROXIDE

Hugh W. Richardson, Houston, Tex., assignor to Kocide Chemical Corporation, Houston, Tex.

Filed Mar. 26, 1981, Ser. No. 247,917

Int. Cl.³ C01G *3/02*

U.S. Cl. 423—43 **22 Claims**

1. The method of producing stable cupric hydroxide comprising the steps of:

(a) contacting a soluble alkali metal carbonate or bicarbonate with a soluble copper salt in an aqueous medium to form insoluble active copper carbonate,

(b) contacting said aqueous medium containing insoluble active carbonate copper with an alkali metal hydroxide to form insoluble cupric hydroxide and soluble alkali metal carbonate.

4,490,338

PROCESS FOR SEPARATING TRIVALENT IRON FROM AN AQUEOUS CHLORIDE SOLUTION

Achille De Schepper, Lichtaart, and Marc Coussement, Hove, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Jul. 21, 1980, Ser. No. 169,518

Claims priority, application Luxembourg, Aug. 13, 1979, 81601

Int. Cl.³ C01G 49/00

U.S. Cl. 423—54 12 Claims

1. In the process for separating trivalent iron from an aqueous chloride solution, in which the aqueous solution is contacted with an organic phase containing a neutral organophosphoric ester as an extracting agent for trivalent iron and a long chain aliphatic alcohol as an agent to prevent emulsion formation, the iron-loaded organic phase is separated from the aqueous solution and the iron is re-extracted from the iron-loaded organic phase by contacting this organic phase with water or acidulated water so as to produce an aqueous iron chloride solution, the improvement comprising that an organic phase is used which contains at least about 40 percent in volume of a long chain aliphatic alcohol.

4,490,339

PROCESS FOR RECOVERING TUNGSTEN FROM MOS_3/WS_3 PRECIPITATES

Leo W. Beckstead; Robert F. Hogsett, both of Arvada, Colo., and Dennis E. Voelker, Ft. Madison, Iowa, assignors to Amax Inc., Greenwich, Conn.

Filed Feb. 6, 1984, Ser. No. 577,103

Int. Cl.³ C01G 41/00, 39/00

U.S. Cl. 423—58 4 Claims

1. The process for recovering tungsten from a molybdenum trisulfide precipitate obtained by sulfide precipitation from an aqueous leach solution containing tungsten and molybdenum values with arsenic as an impurity, said precipitate containing co-precipitated tungsten and arsenic which comprises dissolving essentially all of the tungsten and molybdenum values contained in said precipitate using as a solvent an aqueous caustic solution containing at least about 5 but not more than 6 moles of sodium hydroxide per mole of tungsten plus molybdenum contained in said precipitate, separating insoluble material from the resulting leach solution, controlling the sulfide content of said leach solution to be about 4 moles per mole of molybdenum plus arsenic, controlling the solution pH within the range of about 7 to about 8 to form the thiomolybdate species along with an impurity species from the group consisting of thioarsenate and thioarsenite, and while said solution pH is maintained between about 7 and about 8, adding calcium ions to precipitate said tungsten as synthetic scheelite, and separating said scheelite precipitate from said solution containing molybdenum.

4,490,340

PROCESS FOR THE RECOVERY OF HIGH PURITY TANTALUM OXIDE

Joseph E. Ritsko, and Howard L. Acla, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 29, 1984, Ser. No. 584,850

Int. Cl.³ C01G 35/00

U.S. Cl. 423—65 15 Claims

1. A process for producing high purity tantalum oxide from an impure source of tantalum, said process comprising:

(a) contacting said impure source of tantalum with a first hydrofluoric acid solution of sufficient strength and at a sufficient temperature to solubilize the tantalum value and form a first hydrofluoric acid solution,

(b) separating the first hydrofluoric acid solution from any insolubles,

(c) adjusting the pH of said first hydrofluoric acid solution to from about 6.0 to about 8.5 with a base to form a first tantalum precipitate,

(d) separating said first tantalum precipitate from said first hydrofluoric acid solution,

(e) dissolving said first tantalum precipitate in an aqueous solution of hydrochloric acid containing from about 0.2 parts to about 0.4 parts of hydrochloric acid to about 1 part of water,

(f) heating said aqueous solution of hydrochloric acid for a sufficient time to form a second tantalum precipitate, and a first hydrochloric acid solution,

(g) separating the second tantalum precipitate from said first hyrochloric acid solution,

(h) contacting the second tantalum precipitate with a second hydrofluoric acid solution of sufficient strength and at a sufficient temperature to dissolve said second tantalum precipitate,

(i) adjusting the pH of said second hydrofluoric acid solution to from about 6.0 to about 8.5 with a base to form a third tantalum precipitate,

(j) separating said third tantalum precipitate from said second hydrofluoric acid solution,

(k) contacting said third tantalum precipitate with an oxalic acid solution of sufficient strength to dissolve said third tantalum precipitate,

(l) adjusting the pH of the resulting oxalic acid solution to from about 5.1 to about 5.5 with a base,

(m) digesting the resulting tantalum oxalate solution at a sufficient temperature and for a sufficient time to form fourth tantalum precipitate,

(n) separating said fourth tantalum precipitate from a resulting oxalic acid solution,

(o) heating said fourth tantalum precipitate for a sufficient time to form tantalum oxide.

4,490,341

FLUE GAS DESULFURIZATION PROCESS

W. Ronald Cares, Houston, Tex., assignor to The M. W. Kellogg Company, Houston, Tex.

Filed Sep. 1, 1983, Ser. No. 528,491

Int. Cl.³ C01B 17/00

U.S. Cl. 423—242 5 Claims

1. A process for removing sulfur dioxide from waste gas by a wet scrubbing absorption process comprising passing the waste gas into a reaction zone; contacting the waste gas in the reaction zone with an aqueous medium containing calcium carbonate and a magnesium sulfate; adding an aqueous reactant containing slurry to the reaction zne during the reaction of said waste gas with said aqueous medium, said reactant containing slurry containing a ground, partially calcined naturally-occurring limestone reactant selected from the group consisting of magnesium limestone containing 5 to about 45% weight percent magnesium carbonate and dolomitic limestone containing from 35 to 46 weight percent magnesium carbonate, said limestone reactant having been burned at a temperature within the range from about 590° C. to about 725° to produce a partially

calcined product wherein the calcium component thereof is principally calcium carbonate and the magnesium component thereof is principally magnesium oxide, and said partially calcined limestone product thereafter being ground to produce the ground, partially calcined limestone reactant; permitting the waste gas to react with said aqueous medium and slurry in the reaction zone under conditions and for a time to permit the sulfur dioxide to be absorbed therein and thereafter withdrawing the cleaned waste gas from the reaction zone.

4,490,342

SYNTHESIS OF ZSM-23 ZEOLITE

Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 29, 1983, Ser. No. 490,083
Int. Cl.³ C01B *33/28*
U.S. Cl. 423—328 **12 Claims**

1. A process for preparing a ZSM-23 zeolite having an X-ray diffraction pattern of Table I, comprising preparing a reaction mixture which comprises sources of an alkali metal, an oxide of aluminum (Al_2O_3), an oxide of silicon (SiO_2), water and a nitrogen-containing organic cation R^+ and having the following composition, in terms of mole ratios:

SiO_2/Al_2O_3=40 to 5000
H_2O/SiO_2=5 to 200
OH^-/SiO_2=0 to 0.60
M^+/SiO_2=0.01 to 2.0
R^+/SiO_2=0.01 to 2.0

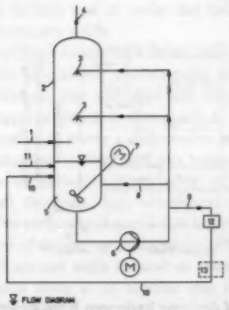
wherein M^+ is a cation of an alkali or alkaline earth metal and R^+ is an organic cation of the formula $(CH_3)_3N^+$—R_1—$N^+(CH_3)_3$ wherein R_1 is a saturated or unsaturated straight chain hydrocarbon group having seven carbon atoms, and maintaining the mixture at crystallization conditions until crystals of the ZSM-23 zeolite are formed.

4,490,343

METHOD FOR THE SEPARATION OF CHLOROSILANES FROM A GASEOUS MIXTURE CONTAINING HYDROGEN CHLORIDE AND HYDROGEN

Dirk Glembin, St. Augustin; Fritz-Robert Kappler, Troisdorf, both of Fed. Rep. of Germany; Luigi Curatolo, Merano, and Vittorio Trapani, Sinigo, both of Italy, assignors to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Filed Dec. 14, 1983, Ser. No. 561,163
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247997
Int. Cl.³ C01B *33/12*
U.S. Cl. 423—336 **9 Claims**



1. A method for the separation of chlorosilanes from a gaseous mixture of hydrogen chloride, hydrogen and chlorosilanes comprising washing the gaseous mixture with a washing liquid consisting essentially of saturated hydrochloric acid.

4,490,344

PRODUCTION PROCESS OF SILICON TETRACHLORIDE

Tadashi Iwai; Hisayuki Mizuno, and Masao Miura, all of Ube, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Sep. 21, 1982, Ser. No. 420,857
Claims priority, application Japan, Sep. 29, 1981, 56-153024
Int. Cl.³ C01B *33/08*
U.S. Cl. 423—341 **15 Claims**

1. A process for producing silicon tetrachloride from carbon, silicon dioxide and chlorine comprising the steps of:

(a) feeding a mixture of a silicon dioxide containing substance and carbon to the top of a reactor in which a reaction mixture forms a downwardly flowing moving bed maintained at a temperature of from 300° C. to 1200° C.;

(b) feeding gaseous boron trichloride to an intermediate portion of the reactor to react with the SiO_2 to form $SiCl_4$ by the reaction

$$3\ SiO_2+4BCl_3 \rightarrow 3SiCl_4+2B_2O_3; \quad (1)$$

(c) feeding gaseous chlorine to a portion of the reactor below the boron trichloride feed whereby B_2O_3formed in reaction (1) reacts with Cl_2 and carbon to form BCl_3 by the reactions

$$B_2O_3+3Cl_2+3C \rightarrow 2BCl_3+3CO; \quad (2)$$

$$2B_2O_3+6Cl_2+3C \rightarrow 4BCl_3+3CO_2; \quad (3)$$

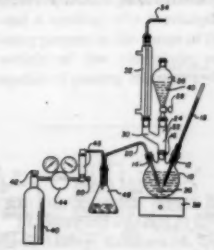
(d) feeding an inert gas to a portion of the reactor located below the chlorine feed to strip volatile materials from reaction residues and withdrawing a gas mixture comprising silicon tetrachloride, boron trichloride and inert gas from the top of the reactor and recovering silicon tetrachloride therefrom.

4,490,345

CONVERSION OF FS SMOKE AGENT (A MIXTURE OF SULFUR TRIOXIDE AND CHLOROSULFONIC ACID) TO SULFAMIC ACID AND AMMONIUM CHLORIDE

Solim S. W. Kwak, Orem, Utah, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 5, 1984, Ser. No. 586,155
Int. Cl.³ C01B *17/00*
U.S. Cl. 423—389 **8 Claims**



1. The process of converting FS smoke agent (a mixture of sulfur trioxide and chlorosulfonic acid) to sulfamic acid and ammonium chloride comprising the steps of:

a. dissolving FS smoke agent into an organic solvent solution to obtain a solvation product,

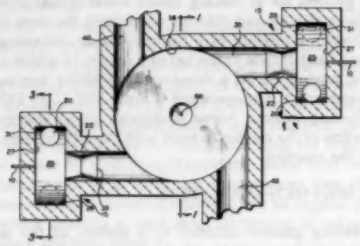
b. subjecting said solvation product with ammonia gas to obtain a sulfamic acid and ammonium chloride mix,

c. separating and purifying said mix into sulfamic acid and ammonium chloride.

4,490,346
METHOD FOR PRODUCING CARBON BLACK

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 12, 1982, Ser. No. 397,318
Int. Cl.³ C01B 31/02; C09C 1/48
U.S. Cl. 423—456 8 Claims

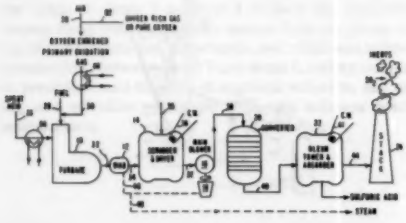


1. A process for producing carbon black comprising:
(a) combusting a fuel gas stream comprising at least 5 percent by volume of at least one of molecular hydrogen and carbon monoxide with an oxidant stream of molecular oxygen-containing gas to provide a combustion product stream then;
(b) combining each standard part by volume of the combustion product stream with at least 0.1 standard parts by volume of a cooler diluent gas stream selected from air and reactor off-gas to provide a tempered combustion product stream having a temperature lower than the temperature of the combustion product stream and sufficiently high to decompose a carbonaceous feedstock and form carbon black; and then
(c) injecting a carbonaceous feedstock into the tempered combustion product stream to form carbon black; and
(d) collecting the carbon black thus produced.

4,490,347
PROCESS FOR SULFURIC ACID REGENERATION

Peter G. Gelblum, Philadelphia, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 7, 1983, Ser. No. 464,429
Int. Cl.³ C01B 17/98, 17/50, 17/90, 17/74
U.S. Cl. 423—521 2 Claims

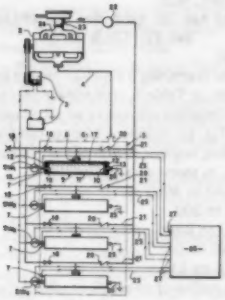


1. In the process for producing oleum from a spend acid mixture of ammonium bisulfate and dilute sulfuric acid, and resulting from the preparation of methyl methacrylate, which process comprises pyrolyzing the mixture by feeding spent acid, fuel and air into a furnace to obtain gaseous oxide products including SO_2; oxidizing the SO_2 to SO_3 with oxygen; and absorbing the SO_3 in concentrated sulfuric acid to form oleum; the improvement comprising:
indirectly heating the spent acid to a temperature of between 100° and 200° C. and separately indirectly heating the air to a temperature between 600° to 1000° C. prior to feeding the heated acid and air directly into the furnace.

4,490,348
METHOD FOR EFFECTING HYDROGEN SORPTION AND DISSOCIATION ON AN ADSORBENT METAL

Tsutomu Mizuno, and Hiroyuki Kusaka, both of Osaka, Japan, assignors to Iwatani Sangyo Kabushiki Kaisha, Japan

Filed Feb. 1, 1983, Ser. No. 462,970
Claims priority, application Japan, Feb. 12, 1982, 57-21794; Feb. 12, 1982, 57-21795
Int. Cl.³ C01B 3/58, 6/00, 6/04; F17C 11/00
U.S. Cl. 423—645 5 Claims

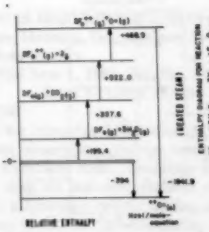


1. In a method for effecting hydrogen sorption on an adsorbent metal at an elevated temperature, the method comprising:
placing said adsorbent metal in a vessel;
providing a pair of electrodes in said vessel, wherein said vessel is insulated from said electrodes;
connecting said electrodes to a source of electrical power;
connecting said adsorbent metal to said electrodes so as to effect electric current therethrough; and
introducing hydrogen into said vessel not earlier than the energizing of said adsorbent metal.

4,490,349
HYDROGEN PRODUCTION

Stephen Horvath, St. Ives, Australia, assignor to Beeston Company Limited, Hong Kong, Hong Kong

Filed Aug. 17, 1981, Ser. No. 293,801
Int. Cl.³ C01B 13/00
U.S. Cl. 423—657 19 Claims



1. A method of deriving hydrogen from superheated steam, comprising:
passing the superheated steam into a reaction chamber in which it is exposed to a pair of chamber walls;
a first chamber wall of said pair being comprised of a reactant capable of reacting exothermally with superheated steam to liberate free hydrogen and to produce an oxi-

dized compound which is dissociable to release oxygen when heated at or above a dissociation temperature;

the second chamber wall of said pair being comprised of a material which is permeable to hydrogen but relatively impermeable to steam and oxygen;

heating said first chamber wall by applying heat to its face remote from the reaction chamber in a reducing atmosphere at or above said dissociation temperature whereby said face is maintained at a higher temperature than the face exposed to the superheated steam within the chamber and oxygen is taken away from said remote face by the reducing atmosphere such that said reactant reacts exothermally with the superheated steam in the chamber to liberate free hydrogen within the chamber and to produce said oxidized compound which compound dissociates so as to continuously regenerate the reactant; and

withdrawing free hydrogen from said chamber by diffusion through said second chamber wall.

9. Apparatus for deriving hydrogen from superheated steam, comprising:

a chamber structure defining a flow-through reaction chamber having an inlet and an outlet and including a pair of chamber boundary walls;

a first chamber wall of said pair comprising a reactant capable of reacting exothermally with superheated steam to liberate free hydrogen and to produce an oxidized compound which is dissociable to release oxygen when heated to or above a dissociation temperature, wherein the face of the first chamber wall remote from the reaction chamber is exposed to a deoxidation chamber;

the second chamber wall of said pair being comprised of a material which is permeable to hydrogen but relatively impermeable to steam and oxygen;

steam inlet means to direct the superheated steam into said chamber through the chamber inlet; and

heating means comprising a hydrogen burner to burn hydrogen within the deoxidation chamber to heat said face of the first chamber wall in a reducing atmosphere at or above said dissociation temperature thereby continuously regenerating said reactant by dissociation of the oxidized compound formed by the reaction with the superheated steam.

18. Apparatus for deriving hydrogen from superheated steam, comprising:

a chamber structure defining a flow-through reaction chamber having an inlet and an outlet and including a pair of chamber boundary walls;

a first chamber wall of said pair being comprised of a reactant capable of reacting exothermally with superheated steam to liberate free hydrogen and to produce an oxidized compound which is dissociable to release oxygen when heated to or above a dissociation temperature;

the second chamber wall of said pair being comprised of a membrane of palladium-silver alloy of less than 0.01 inches wall thickness, said membrane covered over a portion of its surface area exposed to the reaction chamber with a layer of copper approximately 0.0005 inches thick;

said first and second walls formed as concentric tubes between which there is an annular gap constituting said reaction chamber;

steam inlet means to direct the superheated steam into said chamber through the chamber inlet;

heating means to heat the first chamber wall; and

hydrogen extraction means to extract hydrogen from the chamber by diffusion through said second chamber wall.

4,490,350

CARRIER-FREE RADIOLABELLED METYRAPONES

Lise Zolle, Zimmermanngasse 22/8, Vienna, Austria 1090

Filed Apr. 12, 1982, Ser. No. 367,372
Int. Cl.³ A61K 49/02
U.S. Cl. 424—1.1 8 Claims

3. A process for making an adrenal scanning agent comprising the steps of:

converting metyrapone to its mono-N-oxide;

converting the resulting metyrapone mono-N-oxide to 4'-bromo-metyrapone;

exchange labelling 4'-bromo-metyrapone with $Na^{131}I$, $Na^{77}Br$ or $Na^{123}I$, to form the corresponding 4-radiolabelled metyrapone.

4,490,351

METHODS OF TREATING DISORDERS OF AN EYE WITH LIQUID PERFLUOROCARBONS

Leland C. Clark, Jr., Cincinnati, Ohio, assignor to Children's Hospital Medical Center, Cincinnati, Ohio

Filed Mar. 15, 1982, Ser. No. 358,055
Int. Cl.³ A61K 49/04, 31/025
U.S. Cl. 424—5 30 Claims

1. A method of treating an intraocular structural disorder of an eye comprising introducing into the intraocular structure under treatment a liquid comprising a liquid perfluorocarbon or substituted derivative thereof in an amount effective to treat said intraocular structural disorder.

4,490,352

ENCAPSULATED EFFICACIOUS ZINC PHOSPHIDE RODENTICIDE

George T. Miller, Lewiston, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 256,742, Apr. 23, 1981, Pat. No. 4,376,112. This application Oct. 18, 1982, Ser. No. 434,805
The portion of the term of this patent subsequent to Mar. 8, 2000, has been disclaimed.
Int. Cl.³ A01N 59/26
U.S. Cl. 424—17 21 Claims

1. A particulate encapsulated product comprising a core of zinc phosphide and a coating of a thermoplastic polyamide, said polyamide being present in the range of from about 2% to about 10% by weight of zinc phosphide, said encapsulated product being capable of passing through a 40 mesh screen.

4,490,353

ANTIPLAQUE DENTIFRICE WITH IMPROVED FLUORIDE STABILITY

Richard J. Crawford, Asbury; Kathleen M. Yuhasz, Fords, and John P. Curtis, Glen Gardner, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 13, 1983, Ser. No. 513,474
Int. Cl.³ A61K 7/16, 7/18, 7/22
U.S. Cl. 424—52 17 Claims

1. A stable antiplaque dentifrice with improved foaming and improved fluoride stability, comprising an effective amount of an antiplaque quaternary ammonium compound, at least 1.5% betaine surfactant by weight, a humectant selected from the group consisting of polyethylene glycol, sorbitol and mixtures thereof, a nonionic gelling agent, a fluoride-providing compound, in an aqueous vehicle containing a dental abrasive.

4,490,354

ANTIPERSPIRANT METHOD CONTAINING VANADIUM SALTS

Lewis S. Meriwether, Wilton, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 139,364, Apr. 11, 1980, abandoned. This application May 1, 1981, Ser. No. 259,746

Int. Cl.³ A61K 7/32, 7/34, 7/36, 7/38

U.S. Cl. 424—65 6 Claims

1. A method of inhibiting perspiration on the skin which comprises topically administering to the skin a water-soluble vanadium salt wherein the vanadium has a valance number of 3, 4 or 5.

4,490,355

BETAINE BASED COSMETIC FORMULATIONS

Bharat B. Desai, Belle Mead, N.J., assignor to Miranol Chemical Company, Inc., South Brunswick, N.J.

Filed Mar. 14, 1983, Ser. No. 475,130

Int. Cl.³ A61K 7/06, 47/00; C11D 1/94

U.S. Cl. 424—70 7 Claims

1. A composition suitable for use in hair and skin care cosmetic formulations which comprises a blend of cocoamidopropyl betaine and oleamidopropyl betaine in a ratio of from about 1:4 to about 3:2.

4,490,356

SURFACE-ACTIVE POLYSILOXANES

Henri Sebag, Paris, and Guy Vanlerberghe, Claye-Souilly, both of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 345,097, Feb. 2, 1982, , which is a division of Ser. No. 098,329, Nov. 27, 1979, Pat. No. 4,342,742. This application Sep. 8, 1983, Ser. No. 530,275

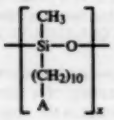
Claims priority, application France, Dec. 5, 1978, 78 34268

The portion of the term of this patent subsequent to Aug. 3, 1999, has been disclaimed.

Int. Cl.³ A61K 7/06, 7/09, 7/13; C11D 17/00

U.S. Cl. 424—70 6 Claims

1. A hair dye composition comprising in a diluent or carrier (i) at least 0.5×10^{-2} gram/liter of a polysiloxane having the formula



wherein

x denotes an integer from 3–10 and

A denotes a cationic, anionic, zwitterionic or non-ionic hydrophilic unit which contains one or more of the same or different groups which are amine, amine oxide, ammonium, ammonioalkylcarboxylate, ammonioalkylsulphonate, amide, sulphonamide, ether, thioether, sulphoxide, hydroxyl, ester or acid groups and (ii) a hair dyeing amount of a hair dye.

4,490,357

SIMPLIFIED IN-VITRO INTERFERON PRODUCTION

Simon V. Skurkovich, and Boris Skurkovich, both of 261 Congressional La., #709, Rockville, Md. 20852

Filed Dec. 30, 1981, Ser. No. 335,699

Int. Cl.³ A61K 45/02; C12P 21/00

U.S. Cl. 424—85 25 Claims

1. In a process comprising introducing an interferon inducing substance into in-vitro culture of leukocytes isolated from whole blood, incubating said culture under conditions producing interferon and separating an interferon-containing preparation from said incubated culture, the improvement comprising said in-vitro culture comprising said whole blood.

4,490,358

SCREENING VACCINES AND IMMUNIZATION PROCESS

Mark I. Greene, Chestnut Hill, and Bernard N. Fields, West Newton, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Mar. 1, 1982, Ser. No. 353,257

Int. Cl.³ A61K 39/395, 39/42; G01N 33/54, 33/56

U.S. Cl. 424—86 8 Claims

1. The method of immunizing a host mammal against an infectious organism having a site which binds specifically to a receptor site on a host cell which method comprises

providing a first monoclonal antibody which binds specifically to said organism site,

providing a second monoclonal antibody which binds specifically to the first, and

inoculating said mammal with an effective amount of said second antibody to bind specifically to said receptor site and block binding of said organism thereto.

4,490,359

QUALITY IMPROVER FOR ANIMAL FUR

Makoto Kimura, Tokyo, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 274,361, Jun. 16, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 451,321

Claims priority, application Japan, Jun. 17, 1980, 55-80906

Int. Cl.³ A61K 31/07

U.S. Cl. 424—93 5 Claims

1. A method of enhancing production of fur in rabbits or minks, or wool in sheep, which comprises administering orally to the animal an amount of *Bacillus subtilis* var. *natto* strain BN sufficient to enhance production of fur or wool on the animal.

4,490,360

FIREFLY-DERIVED REPELLENT COMPOSITIONS AND METHODS OF USE

Steven J. Antonik, St. Louis, Mo., assignor to Duke University, Durham, N.C.

Continuation-in-part of Ser. No. 103,341, Dec. 13, 1979, Pat. No. 4,340,587. This application Jul. 19, 1982, Ser. No. 399,265

Int. Cl.³ A01N 63/02

U.S. Cl. 424—95 16 Claims

1. A method of repelling insects, fish, birds and mammals comprising indroducing an effective amount of a repellent composition which comprises as the active ingredient aqueous dispersions of fireflies, suspensions of lanterns of fireflies, suspensions of fresh fireflies, suspensions of fireflies excluding lantern, organic solvent solutions of extracts of fireflies, dried fireflies, lyophilized fireflies or a mixture thereof, wherein said fireflies are of the genus Photinus, to the area from which said organisms are to be excluded.

4,490,361

VIRUS INACTIVATING HEAT TREATMENT OF PLASMA FRACTIONS

Charles M. Heldebrant, Arcadia, Calif., assignor to Alpha Therapeutic Corporation, Los Angeles, Calif.

Filed Dec. 2, 1983, Ser. No. 557,665

Int. Cl.³ A61K 35/16

U.S. Cl. 424—101 24 Claims

1. A process for inactivating a virus associated with a biologically active material, the process comprising the steps of:

(a) providing the biological material in the form of a dry powder;

(b) mixing the dry biological material powder into an organic liquid to thereby form a suspension of the powder in the liquid;

(c) heating the suspension formed in step (b) to a selected temperature for a selected period of time to thereby inactivate any virus associated with the biological material, while substantially maintaining the biological activity of the biological material; and thereafter

(d) separating the suspended biological material from the organic liquid and recovering the separated biological material.

15. A process for inactivating a virus associated with a plasma fraction containing Factor VIII, the process comprising the steps of:

(a) providing the plasma fraction in the form of a dry powder;

(b) mixing the dry plasma fraction powder into an organic liquid to thereby form a suspension of the powder in the liquid;

(c) heating the suspension formed in step (b) to a temperature in the range of from about 60° C. to about 100° C. for a selected period of time to thereby inactivate any virus associated with the plasma fraction, while substantially maintaining the biological activity of the Factor VIII contained in the plasma fraction; and thereafter

(d) separating the suspended plasma fraction from the organic liquid and recovering the separated plasma fraction.

4,490,362

IMMUNOPOTENTIATOR COMPRISING THE B CHAIN OF RICIN AS AN ACTIVE INGREDIENT

Hiroshi Shionoya, Saitama; Hitoshi Takeuchi, Tokyo, and Gunki Funatsu, Fukuoka, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed May 26, 1982, Ser. No. 382,364

Claims priority, application Japan, May 27, 1981, 56-79146

Int. Cl.³ A61K *37/02, 39/00*

U.S. Cl. 424—177 **7 Claims**

1. An aqueous immunopotentiator composition comprising the B chain of ricin in an aqueous solution, said aqueous composition being in an injectable dosage form, and wherein the B chain of ricin is present in said aqueous composition in a concentration of 10 ng to 100 mg/ml.

4,490,363

METORPHAMIDE—A NOVEL MORPHINE-LIKE PEPTIDE

Jack D. Barchas, Stanford; Eckard Weber, and Christopher J. Evans, both of Palo Alto, all of Calif., assignors to Board of Trustees of The Leland Stanford Junior University Stanford Univ., Stanford, Calif.

Filed Jun. 24, 1983, Ser. No. 508,140

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 **3 Claims**

1. A biologically pure polypeptide of the formula Tyr-Gly-Gly-Phe-Met-Arg-Arg-Val-NH_2.

4,490,364

CCK AGONISTS II

Jean E. F. Rivier, La Jolla, Calif., and Botond Penke, Budapest, Hungary, assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 496,455, May 20, 1983,. This application Aug. 12, 1983, Ser. No. 522,846

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 **31 Claims**

1. A synthetic peptide having the formula: X—R_0—R_1—Tyr(Y)—R_3—R_4—Trp—R_6—R_7—R_8—NHQ wherein X is H, Suc, Ac, Oxa, Mal, Glt, Prp, Prl or Acr; R_0 is Gln, pGlu, Cys, Tyr, Tyr(OCH₃), des—NH_2—Tyr or desR_0; R_1 is Asp, Tyr(OH or SE), Ser(OH or SE), Hyp(OH or Se), Thr(OH or SE), Cys, Tyr(OCH₃) or desR_1; Y is OH or SE; R_3 is Met, Nva or Nle; R_4 is Gly, D—Cys or D—Ala; R_6 is Met, Nva or Nle; R_7 is Ser(SE), Thr(SE) or Hyp(SE); R_8 is Phe or Tyr(OCH₃); and Q is lower alkyl, fluoro lower alkyl or hydrogen; or a pharmaceutically acceptable salt thereof.

4,490,365

DEFLEECING COMPOUNDS

Basil A. Panaretto, Cheltenham; Geoffrey P. M. Moore, North Ryde, and Duncan M. Robertson, Mosman, all of Australia, assignors to Commonwealth Scientifique & Industrial Research Organization, Australia

Continuation of Ser. No. 287,489, Jul. 7, 1981, abandoned. This application Nov. 21, 1983, Ser. No. 553,686

Claims priority, application Australia, Aug. 4, 1980, PE4852

Int. Cl.³ A61K *37/00*

U.S. Cl. 424—177 **6 Claims**

1. In a method of depilating a wool bearing animal, the step of reducing the force holding the wool to the animal which comprises administering to such animal in an amount sufficient to reduce the plucking force needed to remove the wool from the animal without causing injury or unacceptable stress to the animal EGF which contains a sequence of amino acids which is effective in regulating hair growth or an analogue of EGF which contains such sequence.

4,490,366

2'-DEOXY-5-FLUOROURIDINE DERIVATIVE AND A PROCESS FOR PRODUCING THE SAME AND AN ANTITUMOR AGENT COMPRISING THE SAME

Setsuro Fujii, Toyonaka, and Eiichi Sakakibara, Kobe, both of Japan, assignors to Funai Pharmaceutical Ind., Ltd., Osaka, Japan

Division of Ser. No. 068,340, Aug. 21, 1979,. This application Sep. 16, 1982, Ser. No. 419,014

Claims priority, application Japan, Sep. 5, 1978, 53-108955

Int. Cl.³ A61K *31/70*

U.S. Cl. 424—180 **2 Claims**

1. A pharmaceutical composition containing an effective anti-tumor amount of 2'-deoxy-3',5'-di-O-acetyl-3-(3-methylbenzoyl)uridine as the active ingredient and a pharmaceutically acceptable carrier or diluent.

4,490,367

Patent Not Issued For This Number

4,490,368

DIURETIC AND ANTIHYPERTENSIVE COMPOSITION COMPRISING XIPAMIDE AND TRIAMTERENE

Rainer Dies, Hamburg, and Bodo Asmussen, Ammersbeck, both of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,540

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1981, 3143471

Int. Cl.³ A61K *31/62*

U.S. Cl. 424—232 **7 Claims**

1. Pharmaceutical composition for diuretic and antihypertensive use containing 1 part by weight of xipamide and 3–4 parts by weight of triamterene.

4,490,369
BENZAZEPINE DERIVATIVES, THEIR PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Manfred Reiffen, Biberach; Joachim Heider, Warthausen; Norbert Hauel, Biberach; Volkhard Austel, Biberach; Wolfgang Eberlein, Biberach, all of Fed. Rep. of Germany; Walter Kobinger; Christian Lillie, both of Vienna, Austria; Klaus Noll, Warthausen, Fed. Rep. of Germany; Helmut Pieper, Biberach, Fed. Rep. of Germany; Gerd Krüger, Biberach, Fed. Rep. of Germany, and Johannes Keck, Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae Gesellschaft mit beschränkter Haftung, Biberach an der Riss, Fed. Rep. of Germany

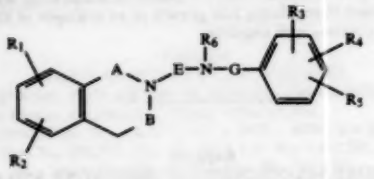
Continuation-in-part of Ser. No. 523,630, Aug. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 377,599, May 12, 1982, abandoned. This application Nov. 2, 1983, Ser. No. 547,940

Claims priority, application Fed. Rep. of Germany, May 19, 1981, 3119874; Nov. 18, 1982, 3242599

Int. Cl.³ A61K *31/55;* **C07D** *223/16, 491/55, 521/00*

U.S. Cl. 424—244 **14 Claims**

1. A compound of the formula

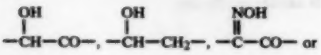


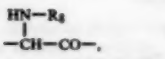
wherein

A is $-CH_2-CH_2-$, $-CH=CH-$, $-NH-CO$, $-CH_2CO-$ or

where R_7 is alkyl of 1 to 3 carbon atoms, and B is methylene, carbonyl or thiocarbonyl; or

A is $-CO-CO-$, $-N=CH-$,





where R_8 is hydrogen or alkyl of 1 to 3 carbon atoms substituted by a phenyl, methoxyphenyl or dimethoxyphenyl, and B is methylene;

E is n-alkylene of 2 to 4 carbon atoms optionally substituted by an alkyl of 1 to 3 carbon atoms, 2-hydroxy-n-propylene, 2-hydroxy-n-butylene or 3-hydroxy-n-butylene;

G is n-alkylene of 1 to 5 carbon atoms optionally substituted by an alkyl of 1 to 3 carbon atoms, wherein one methylene group of an n-alkylene of 2 to 5 carbon atoms can be replaced by a carbonyl group, with the proviso that B is methylene or carbonyl; or methylene-n-hydroxy-alkylene of 1 to 4 carbon atoms, where the methylene group is attached to the nitrogen atom;

R_1 is hydrogen, fluorine, chlorine, bromine, trifluoromethyl, amino, hydroxyl, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, phenyl(alkoxy of 1 to 3 carbon atoms), (alkyl of 1 to 3 carbon atoms)amino or di(alkyl of 1 to 3 carbon atoms)amino;

R_2 is hydrogen, fluorine, chlorine, bromine, hydroxyl, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms or phenyl(alkoxy of 1 to 3 carbon atoms); or

R_1 and R_2, together with each other, are alkylene of 1 to 2 carbon atoms)dioxy;

R_3 is hydrogen, fluorine, chlorine, bromine, hydroxy, cyano, nitro, trifluoromethyl, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

R_4 is hydrogen, alkyl of 1 to 3 carbon atoms, hydroxy, alkoxy of 1 to 3 carbon atoms, amino, (alkyl of 1 to 3 carbon atoms)amino, di(alkyl of 1 to 3 carbon atoms-)amino, (alkanoyl of 1 to 3 carbon atoms)amino, (alkoxy of 1 to 3 carbon atoms)carbonylamino, bis[(alkoxy of 1 to 3 carbon atoms)carbonyl]amino, (trifluoromethyl-methyl-)amino or (trifluoromethyl-ethyl)-amino; or

R_3 and R_4, together with each other, are (alkylene of 1 to 2 carbon atoms)dioxy;

R_5 is hydrogen, chlorine, bromine, cyano, hydroxy, alkyl or alkoxy, where each alkyl moiety may contain 1 to 4 carbon atoms; and

R_6 is hydrogen, alkyl of 1 to 3 carbon atoms, phenyl(alkyl of 1 to 3 carbon atoms), alkanoyl of 1 to 3 carbon atoms, (alkoxy of 1 to 3 carbon atoms)carbonyl or alkenyl of 3 to 5 carbon atoms;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

14. The method of lowering the heart rate of a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective bradycardiac amount of a compound of claim 1.

4,490,370
NAPHTHYLGLYCYL CEPHALOSPORIN DERIVATIVES

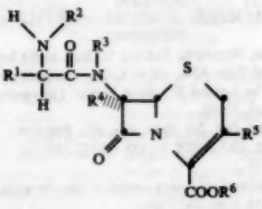
Robin D. G. Cooper; Larry C. Blaszczak, both of Indianapolis, and Jan R. Turner, Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 12, 1983, Ser. No. 484,128

Int. Cl.³ A61K *31/545;* **C07D** *501/22*

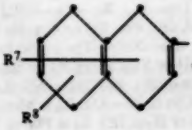
U.S. Cl. 424—246 **40 Claims**

1. A compound of the formula



wherein:

R^1 is



, or

-continued

in which R^7 and R^8 independently are hydrogen, halo, hydroxy, C_1–C_4 alkyl, C_1–C_4 alkyoxy, nitro, amino, C_1–C_4 alkanoylamino, C_1–C_4 alkylsulfonylamino, or when R^7 and R^8 are on adjacent carbon atoms, they can be taken together to form methylenedioxy;

R^2 is hydrogen, an amino protecting group, and R^3 is hydrogen, or R^2 and R^3 taken together are

where M and N independently are C_1–C_4 alkyl;

R^4 is hydrogen, methoxy or methylthio;

R^5 is hydrogen, methoxy, methyl, halo, or methoxymethyl;

R^6 is hydrogen, a salt forming cation group, or a carboxy protecting group; and the pharmaceutically acceptable acid addition salts thereof.

4,490,371

N,N-DISUBSTITUTED-(2-OXO-1,2,3,5-TETRAHYDROIMIDAZO-[2,1-B]QUINAZOLINYL)OXYALKYLAMIDES

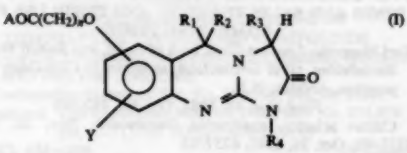
Gordon H. Jones, Cupertino; Michael C. Venuti, San Francisco; Robert Alvarez, Menlo Park, and John J. Bruno, Redwood City, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Feb. 16, 1983, Ser. No. 467,125

Int. Cl.[3] A61K *31/505*; C07D *487/04*

U.S. Cl. 424—248.54 **22 Claims**

1. A compound according to the formula



(I)

and the pharmaceutically acceptable acid addition salts thereof wherein:

n is an integer of 1 to 6;

R_1 is hydrogen or alkyl of 1 to 4 carbons;

R_2 is hydrogen or R_1 and R_2 are combined to form an oxo group;

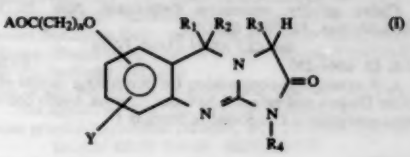
R_3 is hydrogen, alkyl of 1 to 6 carbons, phenyl, benzyl or hydroxy lower alkyl;

R_4 is hydrogen, alkyl of 1 to 6 carbons, benzyl, or hydroxy lower alkyl;

Y is hydrogen, alkyl of 1 to 4 carbon atoms, halo or lower alkoxy;

A is an amide forming group wherein the nitrogen substituents are: hydrogen; alkyl of 1 to 6 carbon atoms; hydroxyalkyl of 1 to 6 carbon atoms and its aliphatic acylates of 1 to 6 carbon atoms or aryl acylates of 7 to 12 carbon atoms; cycloalkyl of 3 to 7 carbon atoms or cycloalkyl lower alkyl of 4 to 11 carbon atoms wherein the cycloalkyl ring is unsubstituted or substituted with a lower alkyl, lower alkoxy, OH, —OCOR$_5$, halo, —NH$_2$, —N(R$_5$)$_2$, —NHCOR$_5$, —COOH, or —COO(R$_5$) group wherein R$_5$ is lower alkyl; phenyl or phenyl lower alkyl wherein phenyl is unsubstituted or substituted with 1 or more lower alkyl, halo or lower alkoxy groups or an NH$_2$, —N(R$_5$)$_2$, —NHCOR$_5$, —COOH, or —COOR$_5$ group wherein R$_5$ is lower alkyl; morpholinyl; piperidinyl; perhexylenyl; N-loweralkylpiperazinyl; tetrahydroquinolinyl; tetrahydroisoquinolinyl; (±)-decahydroquinolinyl or indolinyl.

16. A pharmaceutical composition comprising a pharmaceutically acceptable excipient and a compound of the formula



(I)

and the pharmaceutically acceptable acid addition salts thereof wherein

n is an integer of 1 to 6;

R_1 is hydrogen or alkyl of 1 to 4 carbons;

R_2 is hydrogen or R_1 and R_2 are combined to form an oxo group;

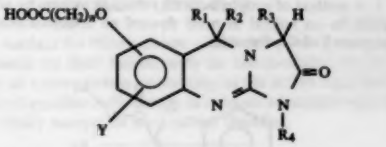
R_3 is hydrogen, alkyl of 1 to 6 carbons, phenyl, benzyl or hydroxy lower alkyl;

R_4 is hydrogen, benzyl, hydroxy lower alkyl or alkyl of 1 to 6 carbons;

Y is hydrogen, alkyl of 1 to 4 carbon atoms, halo or lower alkoxy;

A is an amide forming group wherein the nitrogen substituents are: hydrogen; alkyl of 1 to 6 carbon atoms; hydroxyalkyl of 1 to 6 carbon atoms and its aliphatic acylates of 1 to 6 carbon atoms or aryl acylates of 7 to 2 carbon atoms; cycloalkyl of 3 to 7 carbon atoms or cycloalkyl lower alkyl of 7 to 11 carbon atoms wherein the cycloalkyl ring is unsubstituted or substituted with a lower alkyl, lower alkoxy, OH, —OCOR$_5$, halo, —NH$_2$, —N(R$_5$)$_2$, —NHCOR$_5$, —COOH, or —COO(R$_5$) group wherein R$_5$ is lower alkyl; phenyl or phenyl lower alkyl wherein phenyl is unsubstituted or substituted with 1 or more lower alkyl, halo or lower alkoxy groups or an NH$_2$, —N(R$_5$)$_2$, —NHCOR$_5$, —COOH, or —COOR$_5$ group wherein R$_5$ is lower alkyl; morpholinyl; piperidinyl; perhexylenyl; N-loweralkylpiperazinyl; tetrahydroquinolinyl; tetrahydroisoquinolinyl; (±)-decahydroquinolinyl or indolinyl.

19. A compound of the formula



and the pharmaceutically acceptable acid addition salts thereof wherein

n is an integer of 1 to 6;

R_1 is hydrogen or alkyl of 1 to 4 carbons;

R_2 is hydrogen or R_1 and R_2 are combined to form an oxo group;

R_3 is hydrogen, alkyl of 1 to 6 carbons, phenyl, benzyl or hydroxy lower alkyl;

R_4 is hydrogen, benzyl, hydroxy lower alkyl or alkyl of 1 to 6 carbons; and

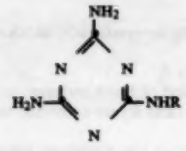
Y is hydrogen, alkyl of 1 to 4 carbon atoms, halo or lower alkoxy.

4,490,372
SYNERGISTIC PESTICIDAL COMPOSITIONS COMPRISING FENVALERATE AND 2,4-DIAMINO-6-CYCLOPROPYLAMINO-S-TRIAZINE OR 2,4-DIAMINO-6-ISOPROPYLAMINO-S-TRIAZINE

Verena Laszio, Arisdorf; Marcus von Orelli, Münchenstein, and Walter Hünsermann, Monthey, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

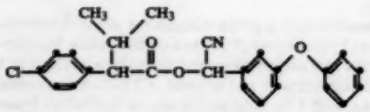
Continuation of Ser. No. 321,843, Nov. 16, 1981, abandoned. This application Jul. 28, 1983, Ser. No. 518,263
Claims priority, application Switzerland, Nov. 25, 1980, 8704/80; Nov. 25, 1980, 8707/80
Int. Cl.³ A01N *43/64, 37/34*
U.S. Cl. 424—249 6 Claims

1. A synergistic composition for controlling insects of the order Diptera and mites of the order Acarina, which compositions comprises a compound of formula I



(I)

in which R is cyclopropyl or isopropyl, and the compound (RS-α-cyano-3-phenoxybenzyl (RS)-2-(4-chlorophenyl)-3-methylbutyrate of the formula IId



(IId)

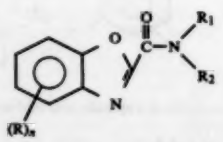
in which the ratio by weight of a compound of formula I to the compound of formula IId in the active ingredient combination is from 9:1 to 1:4.

4,490,373
METHOD OF TREATING ASTHMA

Bernard Loev, Scarsdale, N.Y.; Richard E. Brown, East Hanover; Fu-chih Huang, Boonton, both of N.J., and Howard Jones, Ossining, N.Y., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed May 20, 1983, Ser. No. 496,755
Int. Cl.³ A61K *31/495*
U.S. Cl. 424—250 14 Claims

1. A method of prophylactically treating asthma by administration to an animal in need thereof an effective dose of a compound of the formula



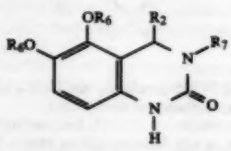
or a pharmaceutically-acceptable acid salt thereof,
wherein,
n can be 0–3,
each R is independently H, halo, lower alkyl, trihaloalkyl, cycloalkyl, hydroxy, lower alkoxy, cyano, carboxyl, a carboxy lower alkyl ester, amino, alkylamino, or dialkylamino, and
R_1 and R_2 are independently H, alkyl, aralkyl, aryl, haloaralkyl, alkoxyalkyl, aminoalkyl, an alkylcarboxylic acid, an alkylcarboxylic acid alkyl ester, or R_1 and R_2 together can form a piperidino, pyrrolidino, morpholino, piperazino, or beta-hydroxyethyl piperazino ring group with the nitrogen to which R_1 and R_2 are attached.

4,490,374
5,6-DIALKOXY-3,4-OPTIONALLY SUBSTITUTED-2(1H)QUINAZOLINONES, COMPOSITION AND METHOD OF USE

Victor T. Bandurco, Bridgewater; Seymour D. Levine, North Brunswick, both of N.J.; Dennis M. Mulvey, New Hope, and Alfonso J. Tobia, Doylestown, both of Pa., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sep. 30, 1982, Ser. No. 430,552
Int. Cl.³ A61K *31/505*; C07D *239/80*
U.S. Cl. 424—251 6 Claims

1. A compound of the formula



wherein R_2 is hydrogen, lower alkyl, cycloalkyl having 4–8 carbon atoms, cycloalkylalkyl wherein the cycloalkyl group has 4–8 carbon atoms and the alkyl group has 1–3 carbon atoms, haloalkyl having 1–3 halogen atoms and 1–4 carbon atoms, norbornyl and norbornylmethyl; R_6 is lower alkyl and R_7 is hydrogen, provided that R_7 is hydrogen only when the 3,4-imine linkage is saturated.

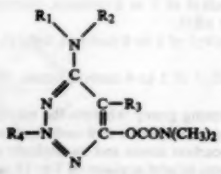
6. The method of treating a patient having a cardiovascular disorder which comprises administering to said patient an effective amount of a compound of claim 1 in a pharmaceutically acceptable carrier.

4,490,375
4-N,N-DIMETHYLCARBAMOYLOXY-6-AMINOPYRIMIDINES AND SALTS THEREOF, AND THEIR USE FOR COMBATING PESTS

Karl Hoegerle; Laurenz Gsell, both of Basel, and Rudolf Wehrli, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 18, 1982, Ser. No. 442,683
Claims priority, application Switzerland, Nov. 25, 1981, 7537/81; Oct. 26, 1982, 6237/82
The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.
Int. Cl.³ C07D *239/47*; A01N *43/54*
U.S. Cl. 424—251 9 Claims

1. A 4-N,N-dimethylcarbamoyloxy-6-aminopyrimidine, and salts thereof, of the formula



(I)

wherein R_1 and R_2 independently of one another are each hydrogen, C_1 –C_5-alkyl, C_1–C_5-haloalkyl, C_3–C_6-cycloalkyl, C_2–C_5-alkenyl or C_2–C_5-alkynyl, or together they are a C_2–C_5-alkylene group; R_3 is halogen or C_1–C_5-alkyl, and R_4 is C_1–C_5-alkyl, or R_3 is hydrogen and R_4 is C_2–C_5-alkyl.

4,490,376

SUBSTITUTED ETHENYL DERIVATIVES OF 1H-PYRAZOLO-[1,5-A]PYRIMIDINE HAVING GASTROENTERIC ACTIVITY, COMPOSITIONS THEREOF, AND METHODS OF USING THE SAME

Gianfederico Doria, Milan; Carlo Passarotti, Gallarate, and Giuliana Arcari, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A, Milan, Italy

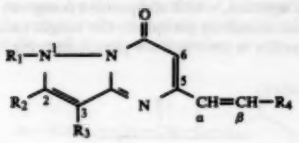
Filed Mar. 14, 1983, Ser. No. 474,887

Claims priority, application United Kingdom, Mar. 25, 1982, 8208763

Int. Cl.³ C07D 487/04; A61K 31/505

U.S. Cl. 424—251 10 Claims

1. A compound of formula (I)



(I)

wherein

R_1 is:

(a) hydrogen or C_1–C_6 alkyl;

(b) an unsubstituted 2-pyridyl or 3-pyridyl group;

(c) a benzyl group, wherein the phenyl ring is unsubstituted or substituted by halogen, C_1–C_6 alkoxy or C_1–C_6 alkyl;

(d) a phenyl ring, unsubstituted or substituted by one or two groups chosen from halogen, trihalomethyl, C_1–C_6 alkoxy, C_1–C_6 alkyl, C_2–C_6 alkanoylamino, nitro and amino;

each of R_2 and R_3 independently represents hydrogen, halogen or C_1–C_6 alkyl;

R_4 represents a 2-pyridyl, 3-pyridyl or 4-pyridyl group, unsubstituted or substituted by C_1–C_6 alkyl;

or the pharmaceutically acceptable salts thereof.

4,490,377

ACID STABILIZED COMPOSITIONS OF THIENO-PYRIDINE DERIVED COMPOUNDS

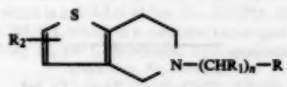
Zaka-Ud-Din T. Chowhan, Sunnyvale, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 173,310, Jul. 29, 1980, abandoned. This application May 10, 1982, Ser. No. 376,878

Int. Cl.³ C07D 513/04; A61K 31/44

U.S. Cl. 424—256 10 Claims

1. A stable pharmaceutical composition comprising a therapeutically effective amount of an active ingredient which is a pharmaceutically acceptable acid addition salt (PAAS) of a compound having the formula



wherein:

R is phenyl or benzyl, each optionally substituted on the phenyl ring with 1 to 3 halogen atoms, alkyl of 1–6 carbon atoms, alkoxy of 1–6 carbon atoms, hydroxy or nitro;

R_1 is hydrogen, halogen, hydroxy or alkyl having 1–6 carbon atoms;

R_2 is hydrogen or halogen; and

n is 1 or 2, and when n is 2, R_1 may have different meaning in each (CHR_1) radical and a non-toxic stabilizing amount of a pharmaceutically acceptable non-volatile acidic compound which is cinnamic acid, glycolic acid, malonic acid, or mandelic acid; and at least one pharmaceutically acceptable excipient.

4,490,378

N-DESMETHYL-N-(ALLYLOXYMETHYL)-VINBLASTINE AND ANTILEUKEMIC AND ANTILYMPHOMIC COMPOSITIONS AND METHOD OF TREATMENT

Lajos Dancsi; Tibor Keve; György Fekete; Eszter Dezsóri; Sándor Görög; Tibor Ács; Csaba Szántay; Lajos Szabó; Katalin Honty; Sándor Eckhardt; Iván Hindi; Sándor Kerpel-Fronius; Zsuzsanna Relle née Somfa, and János Sugár, all of Budapest, Hungary, assignors to Richter Gedeon Vegyészeti Gyar Rt., Budapest, Hungary

Division of Ser. No. 293,611, Aug. 17, 1981, Pat. No. 2,410,459. This application Jun. 13, 1983, Ser. No. 503,791

Claims priority, application Hungary, Oct. 22, 1980, 2563/80

Int. Cl.³ C07D 519/04; A61K 31/475

U.S. Cl. 424—262 3 Claims

1. N-desmethyl-N-(allyloxymethyl)-vinblastine.

2. An antileukemia or antilymphoma composition containing a pharmaceutically effective amount of the compound defined in claim 1 in admixture with an inert pharmaceutical carrier.

3. An antileukemia or antilymphoma method of treatment which comprises the step of administering to an animal subject afflicted by the condition, a pharmaceutically effective amount of the compound defined in claim 1.

4,490,379

METHOD OF REDUCING INTRAOCULAR PRESSURE AND TREATING GLAUCOMA USING CORYNANTHINE

Steven Podos, 2 Knoll Rd., Tenafly, N.J. 07670; Janet B. Serle, 1249 Park Ave., New York, N.Y. 10029, and Thomas Mittag, 167 Woodland Dr., Pleasantville, N.Y. 10570

Filed Apr. 4, 1984, Ser. No. 596,533

Int. Cl.³ A61K 31/475

U.S. Cl. 424—262 6 Claims

1. A method of reducing intraocular pressure in mammals which comprises applying topically to the eye corynanthine or a pharmaceutically acceptable salt thereof in an amount effective to reduce intraocular pressure.

4,490,380

HALOPYRIDINE SULFONAMIDE AS INSECTICIDAL AGENTS

Carl T. Redemann, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 296,608, Aug. 26, 1981, abandoned. This application Mar. 31, 1983, Ser. No. 462,485

Int. Cl.³ A01N 43/40

U.S. Cl. 424—263 1 Claim

1. A method for killing insects which comprises contacting said insects or their habitat with an insecticidally effective amount of a composition containing, as the active ingredient, 3-chloro-2-pyridine sulfonamide in intimate admixture with an insecticidally acceptable inert carrier therefor.

4,490,381

1'-SUBSTITUTED SPIRO[IMIDAZOLIDINE-4,3' INDOLINE]2,2',5-TRIONES

David R. Brittain, Macclesfield, and Robin Wood, Hyde, both of England, assignors to Imperial Chemical Industries PLC, London, England

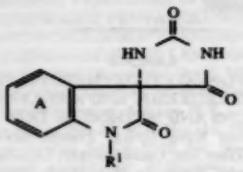
Filed Oct. 29, 1980, Ser. No. 201,973

Claims priority, application United Kingdom, Nov. 13, 1979, 7939235; Aug. 13, 1980, 8026459; Sep. 15, 1980, 8029760

Int. Cl.³ C07D 403/02

U.S. Cl. 424—273 R 9 Claims

1. A 1'-substituted-spiro[imidazolidine-4,3'-indoline]-2,2',5-trione of the formula:



I

wherein:

(a) R^1 is a (1–12C) alkyl or benzyl radical; and benzene ring A bears one or two halogeno radicals;

(b) R^1 is a phenyl, cinnamyl or naphthylmethyl radical the aromatic rings of which optionally bear one or two halogeno radicals; and benzene ring A is unsubstituted or bears one or two halogeno substituents; or

(c) R^1 is a benzyl radical bearing 1–3 substituents independently selected from halogeno, trifluoromethyl, cyano, hydroxy, nitro, methyl and methoxy radicals; and benzene ring A optionally bears one substituent selected from the group consisting of halogeno, (1–4C) alkyl, (1–4C) alkoxy, nitro and hydroxy radicals, or bears two substituents independently selected from the group consisting of halogeno, (1–4C) alkyl and nitro radicals; or a pharmaceutically acceptable salt thereof.

4,490,382

PENICILLIN DERIVATIVES

Frederic H. Jung, Rilly la Montagne, France, and Gareth M. Davies, Cheshire, England, assignors to Imperial Chemical Industries PLC, London, England and ICI Pharma, Enghien les Bains, France

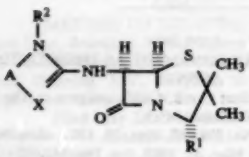
Filed Dec. 22, 1981, Ser. No. 333,567

Claims priority, application France, Dec. 23, 1980, 80 27336

Int. Cl.³ C07D *277/20*; A61K *31/425*

U.S. Cl. 424—270 **6 Claims**

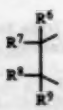
1. A penicillin derivative of the formula I:



I

in which R^1 is a carboxy radical or a radical of the formula $COOCHR^{26}OCOR^{27}$ wherein R^{26} is hydrogen or 1–6C alkyl, R^{27} is 1–6C alkyl, R^2 is hydrogen or methyl; A< is a radical of the formula II or formula III:

II



III

wherein R^4 and R^5 are hydrogen or 1–6C alkyl or are joined together to form a benzene ring, R^6–R^9 are hydrogen, and X is nitrogen, or a pharmaceutically-acceptable acid- or base-addition salt thereof.

4,490,383

PHARMACEUTICAL COMPOSITION

Stuart A. Hill, Worthing, England, assignor to Beecham Group Limited, England

Continuation of Ser. No. 57,942, Jul. 16, 1979, abandoned, which is a continuation of Ser. No. 792,723, May 2, 1977, abandoned, which is a continuation of Ser. No. 133,869, Mar. 25, 1980, abandoned, which is a continuation of Ser. No. 954,420, Oct. 25, 1978, abandoned, which is a division of Ser. No. 792,723, ,. This application Dec. 9, 1982, Ser. No. 448,240

Claims priority, application United Kingdom, May 13, 1976, 19652/76

Int. Cl.³ A61K *31/43*

U.S. Cl. 424—271 **26 Claims**

1. A pharmaceutical composition adapted for administration to a human by injection, which composition comprises sodium amoxycillin and tri-sodium phosphate, the weight ratio of the sodium amoxycillin to the trisodium phosphate being from 8:1 to 50:1.

4,490,384

BENZISOXAZOLE CARBOXYLIC ACIDS

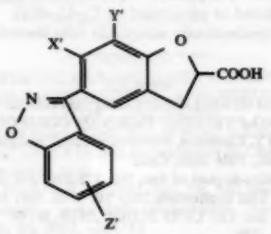
Jacob J. Plattner, Libertyville, and Anthony K. Fung, Waukegan, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 469,059, Feb. 23, 1983, Pat. No. 4,456,612, and a continuation-in-part of Ser. No. 300,361, Sep. 8, 1981,. This application Feb. 27, 1984, Ser. No. 583,923

Int. Cl.³ C07D *261/20*, *261/00*; A61K *31/42*, *31/34*

U.S. Cl. 424—272 **16 Claims**

1. A compound of the formula



wherein X' and Y' may be the same or different and are selected from hydrogen, loweralkyl or halo, and Z' is hydrogen, loweralkyl, halo, hydroxy or loweralkoxy, or pharmaceutically acceptable salts thereof.

4,490,385

TREATMENT OF AUTO-IMMUNE AND INFLAMMATORY DISEASES

Julian Lieb, 41 Village La., Bethany, Conn. 06525

Division of Ser. No. 319,651, Nov. 9, 1981, Pat. No. 4,409,243. This application Oct. 5, 1983, Ser. No. 539,306

Int. Cl.³ A61K *31/42*

U.S. Cl. 424—272 **1 Claim**

1. A method for the treatment of arthritis in a subject which method comprises administering to the subject a monoamine oxidase inhibiting effective amount of isocarboxazid.

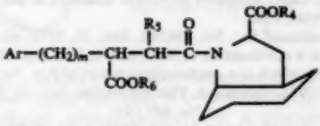
4,490,386
PHOSPHATE SALTS OF 1-[2-[(1-ALKOXYCARBONYL-3-ARALKYL)-AMINO]-1-OXOALKYL]OCTAHYDRO-1H-INDOLE-2-CARBOXYLIC ACIDS, PREPARATION OF, AND MEDICAL COMPOSITIONS THEREOF

Ronald E. Seamans, and Walter E. Behnke, both of Holland, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 23, 1982, Ser. No. 422,499
Int. Cl.³ A61K *31/405*; C07D *209/18*
U.S. Cl. 424—274 **3 Claims**

1. The crystalline phosphate salt of the compound which is 1-[2-[(1-carboethoxy-3-phenylpropyl)amino]-1-oxopropyl]octahydro-1H-indole-2-carboxylic acid.

2. A process for the production of a crystalline phosphate salt of the substituted acyl derivative of octahydro-1H-indole-2-carboxylic acid having the formula



wherein R_4 is hydrogen or lower alkyl; R_5 is hydrogen, lower alkyl or benzyl; R_6 is hydrogen or lower alkyl; Ar is phenyl or phenyl substituted with 1 or 2 substituents selected from the group consisting of fluorine, chlorine, bromine, lower alkyl, lower alkoxy, hydroxy or amino; and m is 0 to 3; wherein lower alkyl and lower alkoxy contain 1 to 4 straight or branched carbon atoms;
said process comprising the steps

(a) treating the suitably substituted acyl derivative of octahydro-1H-indole-2-carboxylic acid addition salt, wherein the acid addition salt is other than the phosphate salt, with a base in a suitable solvent,
(b) filtering the resulting slurry to remove precipitated material, and
(c) treating the filtrate with phosphoric acid and collecting the precipitated phosphate salt.

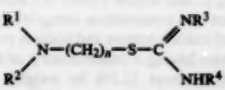
3. A pharmaceutical composition comprising the crystalline phosphate salt of 1-(2-((1-carboethoxy-3-phenylpropyl)amino)-1-oxopropyl)octahydro-1H-indole-2-carboxylic acid and a pharmaceutically acceptable carrier.

4,490,387
PHARMACEUTICAL COMPOSITIONS

Graham J. Durant; Charon R. Ganellin, and Margaret R. Vickers, all of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 269,248, Jun. 1, 1981, Pat. No. 4,378,367, which is a division of Ser. No. 82,836, Oct. 9, 1979, Pat. No. 4,294,854, which is a division of Ser. No. 853,773, Nov. 21, 1977, Pat. No. 4,205,071, which is a continuation-in-part of Ser. No. 795,983, May 11, 1977, abandoned. This application Jan. 17, 1983, Ser. No. 458,610
Int. Cl.³ A61K *00/00*; C07D *207/48*
U.S. Cl. 424—274 **11 Claims**

1. A pharmaceutical composition having immunosuppressant activity comprising a pharmaceutical carrier and, in an effective amount to produce immunosuppressant activity, an isothiourea derivative of the formula:



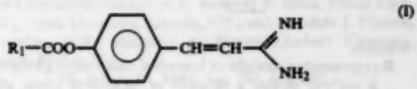
wherein
n is 2, 3 or 4;
R^1 and R^2 together with the nitrogen atom shown form a pyrrolidine ring; and R^3 and R^4, which may be the same or different, are lower alkyl, or together may form a —$(CH_2)x$— group where x is 2, 3 or 4, or a pharmaceutially acceptable acid addition salt thereof.

4,490,388
AMIDINE COMPOUND AND ANTICOMPLEMENT AGENT COMPRISING SAME

Setsuro Fujii, Toyonaka; Takeo Aoyama, Sakura; Yojiro Sakurai, Kamakura; Toyoo Nakayama, Funabashi; Shigeki Nunomura, Chiba; Takashi Yaegashi, Funabashi, and Toshiyuki Okutome, Tokyo, all of Japan, assignors to Torii & Co., Ltd., Tokyo, Japan

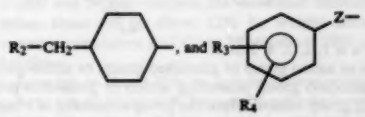
Filed Feb. 22, 1982, Ser. No. 350,964
Claims priority, application Japan, Feb. 27, 1981, 56-27973; Sep. 18, 1981, 56-147289
Int. Cl.³ C07C *101/00*; A61K *31/215*
U.S. Cl. 424—278 **11 Claims**

1. An amidine derivative and a pharmaceutically acceptable acid addition salt thereof, said amidine derivative being represented by the formula (I)



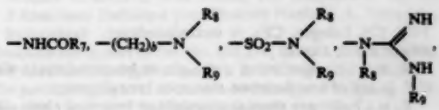
(I)

wherein
R_1 represents a straight or branched chain alkyl group of 1 to 6 carbon atoms, a straight or branched chain alkenyl group possessing 1 to 3 double bonds of 2 to 6 carbon atoms, a cycloalkyl group of 3 to 6 carbon atoms, a cycloalkenyl group possessing 1 to 2 double bonds of 3 to 6 carbon atoms, R_2—$(CH_2)_a$—,



where a is 1, 2, 3, 4, 5 or 6;
R_2 is an amino group or guanidino group, or amino group or guanidino group possessing amino or guanidino protecting group selected from the group consisting of t-butyloxycarbonyl, benzyloxycarbonyl, acetyl, benzoyl, tosyl and nitro groups;
R_3 and R_4, which may the same or different, represent each a hydrogen atom, straight or branched chain alkyl group of 1 to 4 carbon atoms,

—O—R_5, —S—R_5, —$COOR_5$, —COR_6, —O—COR_7,



NO_2, CN, halogen, CF_3, or methylenedioxy, where b is 0, 1 or 2;
R_5 is a hydrogen atom, a straight or branched chain alkyl group of 1 to 4 carbon atoms, or benzyl group;
R_6 is a hydrogen atom or a straight or branched chain alkyl group of 1 to 4 carbon atoms;

R_7 is a straight or branched chain alkyl group of 1 to 4 carbon atoms;

R_8 and R_9, which may be the same or different, are each a hydrogen atom, a straight or branched chain alkyl group of 1 to 4 carbon atoms, or amino protecting group selected from the group consisting of t-butyloxycarbonyl, benzyloxycarbonyl, acetyl, benzoyl, tosyl and nitro groups;

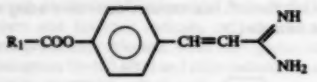
Z represents $-(CH_2)_c-$, $-(CH_2)_d-\underset{R_{10}}{CH}-$ or $-CH=\underset{R_{11}}{C}-$,

where c is 0, 1, 2 or 3, d is 0, 1 or 2;

R_{10} is a straight or branched chain alkyl group of 1 to 4 carbon atoms; and

R_{11} is a hydrogen atom or a straight or branched chain alkyl group of 1 to 4 carbon atoms.

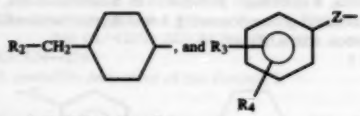
11. An anti-complement agent comprising as active ingredient an amidine derivative or a pharmaceutically acceptable acid addition salt thereof, said amidine derivative being represented by the formula (I)



(I)

wherein

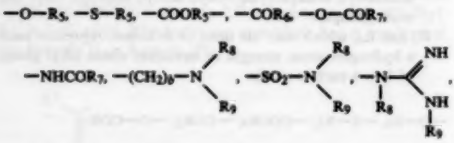
R_1 represents a straight or branched chain alkyl group of 1 to 6 carbon atoms, a straight or branched chain alkenyl group possessing 1 to 3 double bonds of 2 to 6 carbon atoms, a cycloalkyl group of 3 to 6 carbon atoms, a cycloalkenyl group possessing 1 to 2 double bonds of 3 to 6 carbon atoms, $R_2-(CH_2)_a-$,



where a is 1, 2, 3, 4, 5 or 6;

R_2 is an amino group or guanidino group, or amino group or guanidino group possessing amino or guanidino protecting group selected from the group consisting of t-butyloxycarbonyl, benzyloxycarbonyl, acetyl, benzoyl, tosyl and nitro;

R_3 and R_4, which may be the same or different, represent each a hydrogen atom, straight or branched chain alkyl group of 1 to 4 carbon atoms,



NO_2, CN, halogen, CF_3, or methylenedioxy,

where b is 0, 1 or 2;

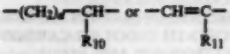
R_5 is a hydrogen atom, a straight or branched chain alkyl group of 1 to 4 carbon atoms, or benzyl group;

R_6 is a hydrogen atom or a straight or branched chain alkyl group of 1 to 4 carbon atoms;

R_7 is a straight or branched chain alkyl group of 1 to 4 carbon atoms;

R_8 and R_9, which may be the same or different, are each a hydrogen atom, a straight or branched chain alkyl group of 1 to 4 carbon atoms, or a benzyloxycarbonyl group;

Z represents $-(CH_2)_c-$,



where c is 0, 1, 2, or 3, d is 0, 1 or 2;

R_{10} is a straight or branched chain alkyl group of 1 to 4 carbon atoms; and

R_{11} is a hydrogen atom or a straight or branched chain alkyl group of 1 to 4 carbon atoms.

4,490,389

CONTACT LENS PRESERVING SOLUTION CONTAINING ASCORBIC ACID OR SALTS THEREOF

Eric L. Nelson, Santa Ana, and Richard L. Harris, Dana Point, both of Calif., assignors to Nelson Research & Development Co., Irvine, Calif.

Continuation of Ser. No. 106,981, Dec. 26, 1979, abandoned, which is a continuation of Ser. No. 941,771, Sep. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 666,067, Mar. 11, 1976, abandoned. This application Jun. 13, 1983, Ser. No. 485,093

Int. Cl.³ A61K *31/365*; C11D *3/48, 00/00*

U.S. Cl. 424—280 **9 Claims**

1. A method for sterilizing contact lenses, comprising:

contacting a hydrophilic soft contact lense with an aqueous composition for a period of time sufficient to sterilize the lens;

said composition having a pH between about 6 and 9 and comprising about 0.01 to about 0.3 percent by weight of an ene-diol compound which is ascorbic acid, esters or salts thereof; and between about 0.1 and about 25 ppm copper ion in solution.

4,490,390

SYNERGISTIC COMPOSITIONS OF CARBAMATE INSECTICIDES

Thomas M. Priester, and Dennis R. Rayner, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 19, 1982, Ser. No. 399,968

Int. Cl.³ A01N *33/24, 37/00, 41/06, 43/08*

U.S. Cl. 424—298 **2 Claims**

1. An insecticidal or miticidal composition of:

(1) methomyl; and

(2) 1,1,1-trifluoro-N-(3-phenylpropyl)-methanesulfonamide as potentiator for methomyl; where the weight ratio of potentiator to methomyl is form about 1:1 to 10:1.

4,490,391

COMPOSITION FOR SHOCK TREATMENT

John E. Flint, R.R. 2, Charles City, Iowa 50616

Filed Aug. 8, 1983, Ser. No. 521,149

Int. Cl.³ A61K *31/19*

U.S. Cl. 424—317 **7 Claims**

1. A method of treating shock and/or stress in animals comprising:

administering to said animal a small but shock treating effective amount of a composition comprising an admixture of solutions of sodium acetate and sodium propionate each of said solutions having a concentration of from about 0.5% by weight to about 12.5% by weight, respectively, of sodium acetate and sodium propionate.

4,490,392

BENZYLALCOHOL DERIVATIVE AND PROCESS FOR PREPARING

Muneyoshi Ikezaki, Ageo; Takeshi Kanno, Omiya; Hajime Iwai, Hasuda, and Masanori Inamasu, Misato, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

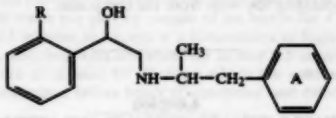
Filed Jul. 27, 1978, Ser. No. 928,431

Claims priority, application Japan, Aug. 11, 1977, 52/96748; Jan. 12, 1978, 53/2557; Jan. 20, 1978, 53/5533; Jan. 20, 1978, 53/5534

Int. Cl.³ A01N *37/30*; C07C *91/16*

U.S. Cl. 424—330 35 Claims

1. A compound of the formula:



wherein R is hydroxy, benzyloxy, halogen or alkoxy of one to four carbon atoms, and Ring A is monomethoxyphenyl, dimethoxyphenyl, trimethoxyphenyl, or a pharmaceutically acceptable acid addition salt thereof.

34. A method of decreasing blood sugar comprising administering to a warm blooded animal a therapeutically effective amount of the compounds claimed in claims 1, 2, 3, 4, 5, or 6.

4,490,393

THIAZOLYLUREA DERIVATIVES, A PROCESS FOR PREPARING SAME AND A PHARMACEUTICAL COMPOSITION CONTAINING SAME

Isao Sakano; Tatsuro Yokoyama; Seitaro Kajiya, all of Yokohama; Tamotsu Minami, Yokosuka; Yutaka Okazaki, Mobara; Hiroshi Tokuda, Mobara; Hiroshi Kawazura, Mobara; Mikio Kumakura, Mobara; Takuo Nakano, and Akira Awaya, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Kagaki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00021, § 371 Date Sep. 17, 1982, § 102(e) Date Sep. 17, 1982, PCT Pub. No. WO82/02553, PCT Pub. Date Aug. 5, 1982

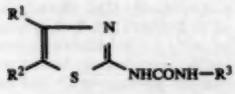
PCT Filed Jan. 21, 1982, Ser. No. 420,260

Claims priority, application Japan, Jan. 21, 1981, 56-6320

Int. Cl.³ C07D *277/46*, *417/12*; A61K *31/425*, *31/44*

U.S. Cl. 424—263 16 Claims

1. Thiazolylurea derivatives of the formula:



(I)

wherein R^1 stands for a lower alkyl group, a phenyl group or a phenyl group substituted with a lower alkyl group, a lower alkoxy group, a lower alkylthio group, a lower alkylamino group, a halogen atom or a nitro group, R^2 for a hydrogen atom, a lower alkyl, alkoxy or alkylthio group, and R^3 for a pyridyl group, an iso-oxazolyl group or a grouping of the general formula:

4,490,394

2,2-DIMETHYL-1,2-DIHYDROQUINOLINE DERIVATIVES USEFUL AS ANTIOXIDANTS, A PROCESS FOR THE PREPARATION THEREOF AND MIXTURES CONTAINING THEM

Dezső Ambrus; Tamas Szabolcsi, and Istvan Hutas, all of Budapest, Hungary, assignors to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

Division of Ser. No. 121,810, Feb. 15, 1980, Pat. No. 4,363,910. This application Mar. 1, 1982, Ser. No. 353,380

Claims priority, application Hungary, Feb. 21, 1979, CI 1916

Int. Cl.³ A23K *3/00*

U.S. Cl. 426—2 3 Claims

1. A method of feeding an animal subject which comprises the steps of intimately mixing with an animal feed 0.001 to 10% by weight of (2,2-dimethyl-1,2-dihydroquinoline-4-yl)-methylsulfonic acid or a salt thereof, and administering the resulting feed mixture to the animal subject.

4,490,395

CHEWING GUM WITH IMPROVED STABILITY

S. Rao Cherukuri, Towaco, N.J.; Kenneth P. Bilka, Floral Park, N.Y.; Frank Hriscisce, Astoria, N.Y., and Dominic J. Piccolo, Brooklyn, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 18, 1983, Ser. No. 485,685

Int. Cl.³ A23G *3/30*

U.S. Cl. 426—3 12 Claims

1. A chewing gum composition having extended flavor taste stability which comprises a chewing gum base having decreased auto-oxidative potential and a flavoring agent, wherein the chewing gum base consisting essentially of:

(a) about 0.5% to about 30% by weight non-SBR elastomer comprising a mixture of isobutylene isoprene copolymer and polyisobutylene having a molecular weight between 37,000 and 80,000 wherein the elastomer mixture comprises about 2% to about 12% by weight isobutylene isoprene copolymer and about 2% to about 20% polyisobutylene;

(b) about 8% to about 38% by weight elastomer solvent;

(c) about 5% to about 45% by weight polyvinylacetate;

(d) about 1% to about 15% by weight glyceryl monostearate emulsifier; and

(e) about 0.5% to about 25% by weight waxes.

4,490,396

PREPARATION OF A FLAVORED SOLID VEGETABLE AND VEGETABLE JUICE UTILIZING HYDROLYSED PROTEIN

Jau Y. Hsu; Elaine R. Wedral, both of Brookfield, Conn., and William J. Klinker, Blue Island, Ill., assignors to Societe d'Assistance Technique pour Produits Nestle S. A., Lausanne, Switzerland

Continuation-in-part of Ser. No. 435,074, Oct. 18, 1982, Pat. No. 4,428,968. This application Oct. 4, 1983, Ser. No. 538,792

The portion of the term of this patent subsequent to Sep. 8, 1999, has been disclaimed.

Int. Cl.³ A23L *1/218*

U.S. Cl. 426—49 3 Claims

1. A process for the production of a flavoured solid vegetable and vegetable juice which comprises fermenting a vegetable in the presence of salt in an amount of from 1.0% to 4.5% by weight based on the weight of the vegetable and a powdered hydrolysed protein in an amount of from 1% to 10% by weight based on the weight of the vegetable.

4,490,397

PROCESS FOR THE PRODUCTION OF PROTEIN FIBRES

Terrence J. Maurice, Colborne, and Jennifer M. Grealy, Gores Landing, both of Canada, assignors to General Foods Inc., Don Mills, Canada

Filed Dec. 23, 1982, Ser. No. 452,702
Int. Cl.³ A23J 3/00
U.S. Cl. 426—276 23 Claims

1. A process for the production of protein fibres, which comprises:

(a) forming an aqueous dispersion of protein micelles consisting of amphiphilic protein moieties from at least one vegetable protein source material,

(b) settling said aqueous dispersion of protein micelles to provide an amorphous protein mass containing a substantially undenatured protein isolate, said isolate having substantially no lipid content, substantially no lysinoalanine content and substantially the same lysine content as the storage protein in the protein source material,

(c) admixing a gellable starch with said substantially undenatured vegetable protein isolate to form an admixture of said gellable starch and said protein isolate which contains from about 0.5 up to about 30 percent by weight of starch, and

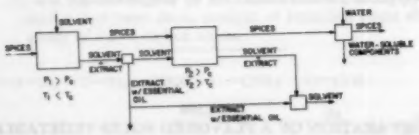
(d) injecting said admixture to form extruded fibers through at least one opening into a hot coagulating medium having a sufficient temperature to effect denaturation of the protein isolate and maintain structural integrity of the extruded fibres.

4,490,398

PROCESS FOR THE PREPARATION OF SPICE EXTRACTS

Norbert Behr, Haan; Henk van der Mei, Rinteln, both of Fed. Rep. of Germany; Wolfgang Sirtl, Zurich, Switzerland; Harald Schnegelberger, Leichlingen, and Othmar von Ettingshausen, Düsseldorf-Unterbach, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 173,403, Jul. 29, 1980, abandoned. This application Jan. 6, 1982, Ser. No. 337,388
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1979, 2931393
Int. Cl.³ A23L 1/221
U.S. Cl. 426—312 4 Claims



1. In a process for the production of extracts from spices in two stages by extraction with a non-toxic gas as solvent,

the improvement which comprises in a first stage extracting from the spices essential oils functioning as aroma components by contacting the spices with liquid solvent, at a pressure in the supercritical range and a temperature in the subcritical range, separating the solvent from the spice, evaporating the solvent and separating essential oils by varying pressure and/or temperature of the liquid solvent, and in a second stage under anhydrous conditions extracting from the spices the portions acting as flavor carriers by contacting the spices from the first stage with gaseous solvent at a pressure and a temperature both in the supercritical range, separating the gaseous solvent from the spice, reducing the pressure and temperature, and separating the flavor carriers from the gaseous solvent by varying the pressure and/or temperature of the gaseous solvent.

4,490,399

PROCESS AND COMPOSITIONS FOR REMOVING TANNINS FROM WINE

Howard H. Weetall, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 15, 1983, Ser. No. 485,478
Int. Cl.³ C12G 2/00, 3/08
U.S. Cl. 426—330.4 4 Claims

1. A process for removing tannins from wine so as to improve the taste is characterized by:

(a) immobilizing solubilized gelatin by attaching the gelatin to an insoluble carrier to form a composite;

(b) contacting a wine containing sour-tasting tannins with the immobilized gelatin composite; and

(c) separating the wine from the composite.

4,490,400

SPOONABLE TOMATO PRODUCT AND METHOD OF MAKING THE SAME

Norman P. F. Duncan, and James E. Sexton, both of Cincinnati, Ohio, assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Dec. 29, 1982, Ser. No. 454,147
Int. Cl.³ A23L 1/24
U.S. Cl. 426—335 32 Claims

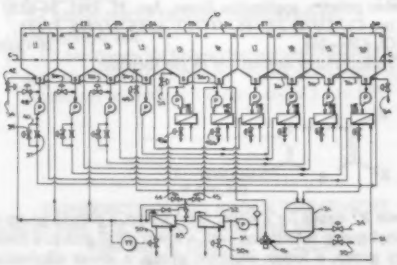
1. A spoonable tomato product comprising a water-in-oil emulsion component and a natural pulpy tomato solids component consisting essentially of actual pieces of natural tomatoes wherein said components are in amounts proportioned to provide a spoonable product having a natural grainy pulpy tomato texture which is stable during use and storage.

4,490,401

PASTEURIZATION METHOD

Kenneth W. Becker, Brookfield; Louis G. Friedrichs, Jr., Milwaukee; Lev Kropp, Glendale, and Richard B. Straka, Milwaukee, all of Wis., assignors to Miller Brewing Company, Milwaukee, Wis.

Division of Ser. No. 388,211, Jun. 14, 1982, Pat. No. 4,441,406. This application Nov. 28, 1983, Ser. No. 555,501
Int. Cl.³ B65B 55/00; A61L 2/04
U.S. Cl. 426—407 3 Claims



1. A method of preventing the over-pasteurization of a product in a container in a tunnel pasteurizer in which the container is conveyed on a conveyor through a heating zone, a pasteurizing zone and a cooling zone and in which over-pasteurization of the product can occur when the conveyor is stopped and the container remains too long in the pasteurizing zone, which method for preventing over-pasteurization comprises reducing the temperature of the product in the container in the pasteurizing zone to a temperature at which no appreciable pasteurization occurs when the conveyor has stopped.

4,490,402
PROCESS FOR PREPARING COLD SOLUBLE TEA PRODUCT

Tito L. Lunder, and Corine M. Nielsen, both of Lausanne, Switzerland, assignors to Societe d'Assistance Technique Pour Produits Nestle S. A., Lausanne, Switzerland

Continuation-in-part of Ser. No. 447,164, Dec. 6, 1982, abandoned. This application Mar. 4, 1983, Ser. No. 472,006

Int. Cl.³ A23F *3/18*

U.S. Cl. 426—422 **11 Claims**

1. A process for preparing a powdered tea extract characterized in that black tea leaves are macerated with a sufficient amount of water to wet, soften and swell the tea leaves at a temperature of from 15° C. to 40° C. for a period of at least 20 minutes, the macerated leaves are extracted first with at least 2 parts cold water per part by weight of tea leaves for a period of from 2.5 minutes to 2 hours at a temperature of from 10° C. to 40° C., and then with hot water for at least 2.5 minutes at a temperature of at least 60° C. after which the cold and hot extracts are mixed before being concentrated and dried.

4,490,403
PROCESS FOR PRODUCING AN AGGLOMERATED POWDERY MILK PRODUCT

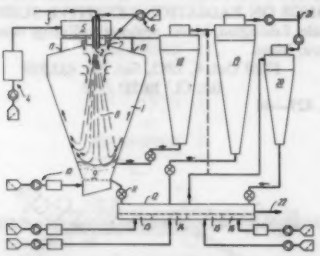
Jan Pisecky, Tåstrup; Jens Krag, Copenhagen, and Ib H. Sorensen, Frederikssund, all of Denmark, assignors to A/S Niro Atomizer, Soborg, Denmark

Filed Jun. 13, 1983, Ser. No. 503,983

Claims priority, application Denmark, Jun. 14, 1982, 2670/82

Int. Cl.³ A23C *9/16*; B01D *1/16*

U.S. Cl. 426—453 **15 Claims**



1. A process for producing an agglomerated powdery milk product, comprising the steps of

(a) atomizing a liquid derived from milk, in the upper part of a conical downward tapering drying chamber by means of a nozzle into a central downward stream of drying gas at 200°–400° C. to produce particles,

(b) maintaining in the lower part of said drying chamber a layer of particles fluidized in an upward stream of gas having a velocity of 0.3–1.5 m/sec, whereby the temperature of said upward stream of gas is adjusted between 10° and 150° C. to maintain the temperature required of the fluidized particles for ensuring the agglomeration ability of said particles with respect to the particles produced in step (a), and wherein the amount of particles in the fluidized layer is adjusted corresponding to a pressure drop of 1.5–4.5 k Pas over the fluidized layer,

(c) adjusting the amount of said liquid to the amount and drying capacity of the downward stream to ensure a moisture content of the particles reaching the fluidized layer between 2–16% and sufficient for agglomerating said particles by forming clusters thereof, but less than the moisture content which would cause formation of monogranules, and also to ensure that the downward gas stream still has a substantial drying capacity upon reaching the fluidized layer and sufficient kinetic energy for penetrating therein, thereby contributing to the drying process in the fluidized layer and promoting removal of particles and small agglomerates from the fluidized layer to the upper part of the drying chamber for agglomerate-forming contact with wet droplets and moist particles,

(d) withdrawing a stream comprising the gas from said downward stream and the gas from said upward stream at a non-central location in the upper part of the drying chamber,

(e) adjusting the amount of drying gas introduced as a central downward stream to be 2–4 times the amount of the upward stream of fluidizing gas, and

(f) recovering agglomerated particles from said fluidized layer.

4,490,404
FLAVORING WITH MACROCYCLIC LACTONE

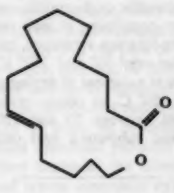
Augustinus G. Van Loveren, Rye, N.Y.; Marie R. Hanna, Hazlet, N.J.; Domenick Luccarelli, Jr., Neptune, N.J.; David R. Bowen, Red Bank, N.J.; Manfred H. Vock, Locust, N.J., and Wilhelmus J. Wiegers, Red Bank, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jul. 18, 1983, Ser. No. 514,523

Int. Cl.³ A23L *1/226, 1/235*

U.S. Cl. 426—536 **1 Claim**

1. A process for augmenting or enhancing the mango aroma or taste of a mango flavored foodstuff or chewing gum comprising the step of intimately admixing with a mango flavored foodstuff or chewing gum base from 0.0001 parts per million up to about 50 parts per million by weight based on total composition of a cis or trans isomer or mixture of cis and trans isomers of the compound defined according to the structure:



4,490,405
SINGLE STEP EXTRACTION OF BITTER PRINCIPLE AND TANNINS FROM HOPS

Louis von Horst, Mainburg, and Alfons Hartl, Germering, both of Fed. Rep. of Germany, assignors to Horst & Klotz Hopfenveredelung GmbH, Mainburg, Fed. Rep. of Germany

Filed Jan. 20, 1982, Ser. No. 340,988

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1981, 3103617

Int. Cl.³ A23L *1/28*

U.S. Cl. 426—600 **5 Claims**

1. In a process for obtaining bitter principle and tannins from hops comprising extracting the hops with aqueous ethanol and subsequently removing the tannin component and recovering the ethanol from said extract, the improvement wherein the tannin component and the ethanol are simultaneously removed from the obtained ethanol extract by continuously pumping the ethanol extract having a solids content of about 75 to 80 percent by weight into a perforated bottom-type column and blowing water vapor countercurrently in a upward direction, or aspirating said extract into an evacuated column and feeding hot water therein, while controlling the amount of water added, thereby forming a two phase product in the form of an upper bitter principle phase and a lower aqueous tannin phase having a specific gravity of about 1.2, and the phases are separated to obtain bitter principle and tannin.

4,490,406

PROCESS FOR OBTAINING LIGHT AND CRISPY SOYBEAN PROTEINS OF AGREEABLE TASTE AND PRODUCT THUS OBTAINED

Aldo Ferrero, and Mauro Ferrero, both of Via Ampère 9, both of Milan, Italy

Filed Oct. 13, 1983, Ser. No. 541,413
Claims priority, application Italy, Nov. 3, 1982, 24040 A/82
Int. Cl.³ A23L 1/20; A23B 4/04
U.S. Cl. 426—634 13 Claims

1. A process for obtaining a soybean protein product of agreeable taste, easily digestible and producing limited flatulence, consisting essentially of:

(a) steam-cooking extruded soybean protein granules, at a pressure between 1 and 7 atm. for a period of about between 3 and 40 minutes;

(b) rapidly increasing the pressure at the end of the cooking step (a) up to a value of 20 atm.; and

(c) lightening and expanding the cooked product by instantaneously reducing the pressure to atmospheric pressure to obtain a puffed product.

4,490,407

METHOD FOR PREPARING GALENIC FORMULATIONS PARTICULARLY FOR PHARMACEUTICAL, DIETETICAL, COSMETIC AND DIAGNOSTIC USES

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons-Alfort, France

Filed Apr. 7, 1983, Ser. No. 482,904
Claims priority, application France, Jan. 25, 1983, 83 01115
Int. Cl.³ A01N 1/02; F26B 5/06
U.S. Cl. 427—2 5 Claims

1. A method for preparing a galenic formulation for pharmaceutical, dietetic, cosmetic or diagnostic use, comprising forming a liquid mixture containing at least one active ingredient and at least one film-forming substance, spraying said mixture at a temperature between 50° and 150° C. to form droplets, drying said droplets in a current of drying gas at a temperature between 100° and 150° C. to obtain coated granules with a diameter comprised between 10 and 120μ, collecting said coated granules, and subjecting said collected granules to lyophilization.

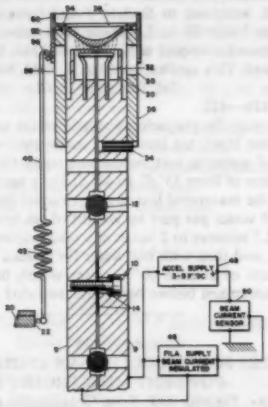
4,490,408

METHOD AND DEVICE FOR METALLIZING THE INTERNAL SURFACE OF A HOLLOW OBJECT

Robert R. Zimmerman; Larry D. Kunkler, both of Beaverton, and Earl R. Helderman, Hillsboro, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 14, 1983, Ser. No. 474,753
Int. Cl.³ B05D 3/06; B05B 5/02
U.S. Cl. 427—42 8 Claims

1. A method of depositing a coating of metallic material on the internal surface of a hollow object which is formed with an opening defined by an elongate neck for providing access to the interior of the object, comprising disposing an elongate member and the hollow member so that the elongate member extends upwardly into the interior of the object by way of the opening, one end of the elongate member being inside the hollow object while an opposite end of the elongated member is outside the object, said elongate member including mutually electrically-insulated conductors extending from said one end to said opposite end, a filament having two opposite ends connected to said conductors respectively at said one end of the elongate member, and a crucible containing metal to be deposited and supported at said one end of the elongate member above the filament and in spaced relationship thereto, at least a portion of the surface of the crucible facing the filament being electrically conductive, and said method also comprising supplying current to said filament by way of said conductors for heating said filament to achieve thermonic emission, and connecting the filament and said portion of the crucible to negative and positive terminals respectively of a potential source so that electrons emitted by the filament are accelerated



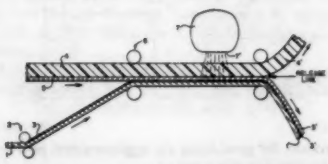
towards the crucible and cause the crucible to be heated by electron bombardment.

4,490,409

PROCESS AND APPARATUS FOR DECORATING THE SURFACES OF ELECTRON IRRADIATION CURED COATINGS ON RADIATION-SENSITIVE SUBSTRATES

Sam Nablo, Lexington, Mass., assignor to Energy Sciences, Inc., Woburn, Mass.

Filed Oct. 4, 1982, Ser. No. 432,569
Int. Cl.³ B05D 3/06
U.S. Cl. 427—44 11 Claims



1. A continuous in-line process for the substantially uniform electron beam curing of an adhesive coating disposed within an assembly having an electron permeable release layer that carries a mechanically adhered decorative layer to which is applied the coating and that is in turn applied to a radiation-sensitive substrate, comprising, continuously passing the coated release-layer-decorative layer and substrate assembly along a predetermined path at a predetermined line speed; pressing the assembly together; accelerating electron strip beam radiation through an electron-permeable window adjacent to a predetermined region of said path and causing the accelerated strip beam radiation to impinge upon said region over the entire elongated cross-sectional area of the beam simultaneously and substantially uniformly perpendicular to said path; maintaining substantially the entire impinging strip beam radiation at said region at a predetermined energy level selected within energy limits of from substantially 80 to 180 KeV; adjusting the dose delivered by the beam at the predetermined energy level to the pressed-together coated release layer-decorative layer and substrate assembly at said region to a predetermined value within dose limits of from substantially 0.5 to several megarads; the energy and dose being matched to the thickness and materials of the coated release layer-decorative layer and substrate in order to concentrate the principal

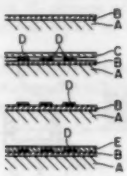
amount of the electron strip beam energy substantially uniformly in said coating and to cure the coating while insuring minimal energy reaction with the release layer, decorative layer and substrate; the decorative layer being attached to one surface of the release layer but susceptible of being stripped therefrom by a predetermined stripping force; the adhesive coating juxtaposed upon the decorative layer between the same and the substrate having sufficient viscosity to stick to the decorative layer and, upon the electron-beam curing of the adhesive layer, bonding to the decorative layer with an adhering force equal to or greater than said predetermined stripping force; the viscosity of the adhesive and the line speed being chosen with regard for the time between the pressing of the assembly together and the curing of the adhesive coating such that the decorative layer remains substantially entirely on the adjacent surface of the adhesive coating; and, as said assembly is continuously moved along said path, peeling the release layer from the substrate with its cured coating and adhered transfered decorative layer.

4,490,410

METHOD OF AFFIXING A DECORATIVE PATTERN TO A STOCK OR A MOLDED COMPONENT

Eiichiro Takiyama, Kamakura, Japan; Toshikazu Tsukui, deceased, late of Sakai, Japan by Kiyoko Tsukui, legal representative; Katsuhisa Morita, and Seiichi Takano, both of Takasaki, Japan, assignors to Showa Highpolymer Co., Ltd., Tokyo, Japan

Filed May 20, 1983, Ser. No. 496,626
Int. Cl.³ B05D 3/06
U.S. Cl. 427—44 **5 Claims**



1. Method for imparting a pattern to a stock or shaped body consisting essentially of:

coating said stock or shaped body with an active energy beam curable resin;

contacting the resin with a film having a releasable pattern printed thereon at a stage where the resin is in a liquid or sticky gelled state prior to curing, said pattern being printed with an ink having a greater affinity for said resin than for said film, irradiating a beam on the pattern-printed film-resin coated body to cure the resin, concomitantly transferring the pattern on the film to the cured resin surface, peeling the film from the cured resin surface and thereafter coating the transferred pattern bearing cured resin surface with a transparent or translucent resin.

4,490,411

APPARATUS FOR AND METHOD OF METALIZING INTERNAL SURFACES OF METAL BODIES SUCH AS TUBES AND PIPES

Darryl Feder, 3134 Maple Leaf Dr., Glenview, Ill. 60025

Filed Mar. 14, 1983, Ser. No. 475,383
Int. Cl.³ B05D 7/22, 3/02
U.S. Cl. 427—46 **9 Claims**

2. An apparatus for internally metalizing an elongated pipe or tube body comprising, in combination:

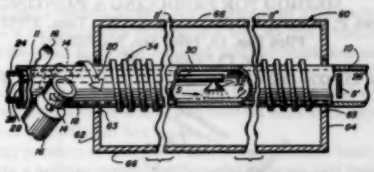
means defining an enclosing metalizing chamber having a first opening through which a first end of the elongated body to be metalized is to enter the chamber, and a second opening through which the metalized elongated body is to exit from the chamber;

the spacing of said first and second openings of the metalizing chamber being less than the length of the elongated pipe body being metalized;

means operatively associated with said elongated body for axially advancing the elongated body only in one direction relative to said chamber while simultaneously rotating said body at a relatively high rpm about its longitudinal axis;

a first heating means positioned within said chamber for locally pre-heating a portion of the elongated body, and the hollow interior thereof adjacent said portion, after it enters the chamber, to a first elevated, selected, pre-heat temperature, as the elongated body advances through the chamber and past said first heating means;

means providing, within the hollow interior of the pipe or tube body that has been pre-heated to said first elevated temperature, for the discharge of an amount of a selected metalizing power in a mixture of particle sizes in the presence of only a pressurized, non-oxidizing gas, whereby to deposit, onto the inner wall of the body, metalizing particles of a nature that will become at least



semi-fluidized at the pre-heat temperature; the tangential force transmitted by the rotating body and the centrifugal force developed on the semi-fluidized metalizing powder particles by the rotation of the pipe or tube being operative to develop within said hollow interior of the body a molten annulus of laminae of metalizing particles, which particles are further distributed radially outwardly of the axis of rotation of the body, by centrifugal force within a sleeve of fluidized metalized particles whose outermost cylindrical surface laminates the interior surface of the tube or pipe, and whose innermost cylindrical surface is forced, by a combination of centrifugal force and the resistance forces between laminae of fluidized particles, to assume a substantially uniform concentricity about the axis of rotation of the tube or pipe;

and a second heating means within said chamber, spaced axially of the body, in the direction from the first heating means toward the second opening in the metalizing chamber for locally heating said pipe and internal annulus of fluidized particles to a second temperature, higher than the pre-heat first temperature, at which the sleeve of fluidized laminae of metalizing meterial fuses together, and with the outermost lamina fusing to the inner wall of the body.

4,490,412

METHOD OF MAKING A SOLAR ENERGY COLLECTOR ELEMENT

Masahiko Yotuyanagi, and Toshio Fukaya, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

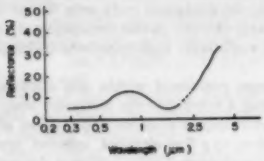
Filed Jun. 2, 1982, Ser. No. 384,397
Claims priority, application Japan, Jun. 4, 1981, 56-84919
Int. Cl.³ B05B 5/00; B05D 5/00, 5/12; C23C 11/10
U.S. Cl. 427—122 **7 Claims**

1. A method of making a solar energy collector element, comprising the steps of:

applying a carbon-containing material on at least a sunlight-

receiving surface of a substrate which comprises an iron material; and

heating at least said sunlight-receiving surface at a temperature in the range of about 200° to about 1,100° C. to form on said substrate a film comprising iron oxide, said heating



being carried out in a gaseous oxidizing atmosphere selected from the group consisting of an air atmosphere, an atmosphere containing oxygen, an atmosphere containing steam, and an air atmosphere containing a small amount of at least one selected from the group consisting of hydrogen, carbon monoxide, and hydrocarbon.

4,490,413

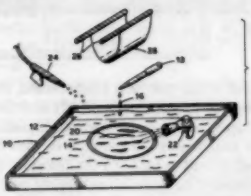
METHOD FOR PRODUCING A PAINTING

Frank P. Stimson, 860 20th St., Knoxville, Tenn. 37915

Filed Feb. 15, 1984, Ser. No. 580,531

Int. Cl.³ B05D *5/06, 1/20*

U.S. Cl. 427—262 **5 Claims**



1. A method for producing a painting using printers litho oil ink, a shallow pan, water, and a flexible sheet comprising:

partially filling the shallow pan with water;

introducing a litho oil ink onto the surface of the water, said ink being capable of forming globules when contacting said surface;

forming a desired pattern in the litho oil ink as it floats on the surface of the water;

allowing the litho oil ink to float undisturbed by external forces on the surface of the water for a time lapse such that the ink has formed into a desired globule pattern, whereby the ink forms a pattern on the water having a textured appearance of depth;

after the time lapse, lowering the flexible sheet in a limp condition onto the surface of the water over the ink with a central portion of the sheet being first lowered onto the water surface; and

lifting the flexible sheet from the water to lift the litho oil ink pattern from the water onto the sheet corresponding to the pattern previously formed on the water's surface.

4,490,414

OPEN CHAIN ANALOGUES OF RETINOIC ACID

Marcia I. Dawson, Los Altos, and Rebecca L. S. Chan, Palo Alto, both of Calif., assignors to SRI International, Menlo Park, Calif.

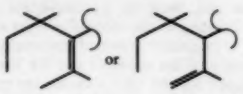
Filed May 11, 1983, Ser. No. 493,507

Int. Cl.³ C07C *57/03, 69/587, 103/133;* **A61K** *31/23*

U.S. Cl. 424—312 **12 Claims**

1. A compound of the formula:

and 2Z isomers thereof where X is



and R is hydroxy, alkoxy with 0 or 1 hydroxy substituent, aroxy or NR^1R^2 where R^1 is hydrogen, alkyl with 0 or 1 hydroxy substituent, aryl and R^2 is alkyl with 0 or 1 hydroxy or aryl.

4,490,415

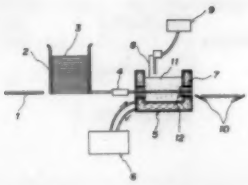
METHOD OF COATING A PENCIL

Kazuyoshi Imamura; Koichi Yasui, both of Miyazaki, and Akeomi Saito, Yamagata, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 191,144, Sep. 26, 1980, abandoned. This application Sep. 7, 1982, Ser. No. 415,724

Int. Cl.³ B05D *1/18, 3/12*

U.S. Cl. 427—358 **10 Claims**



1. A method of coating a pencil which comprises applying onto the surface of a pencil capable of being sharpened by means of a sharpener, without the use of a solvent, a hot-melt polyester prepared from carboxylic acid components and alcohol components, which is molten at a temperature higher than the softening point thereof, followed by cooling for solidification of the hot-melt polyester; the hot-melt polyester having a softening point of 70° to 200° C. and a melt viscosity of 100 to 100,000 centipoises as measured at a temperature 30° C. higher than the softening point of said polyester; and comprising, as carboxylic acid components, 40 to 65 mole % of terephthalic acid monomer units, 10 to 40 mole % of isophthalic acid monomer units and 10 to 40 mole % of monomer units of at least one saturated dicarboxylic acid selected from the group consisting of straight chain or branched saturated aliphatic dicarboxylic acids having 4 to 12 carbon atoms, and as alcohol components, 1,4-butanediol monomer units.

7. A method according to claim 1, wherein the application of the molten hot-melt polyester onto the pencil is effected by feeding a pencil into a coating vessel maintained at a predetermined temperature by means of a heat medium and having therein a molten hot-melt polyester maintained at a constant level with respect to a depth of the molten polyester, passing the pencil through said molten polyester and removing excess hot-melt polyester from the resulting pencil barrel by means of a wiping die.

4,490,416
ORGANOSILOXANE-OXYALKYLENE COPOLYMERS
Stephen Westall, and James W. White, both of Barry, Wales, assignors to Dow Corning Limited, Barry, Wales
Filed May 15, 1984, Ser. No. 610,538
Int. Cl.^{3} B05D *3/02*
U.S. Cl. 427—387 **6 Claims**

1. An organosiloxane-oxyalkylene copolymer wherein at least one silicon atom of an organosiloxane unit has attached thereto a group represented by the general formula

$$-X(OR)_nO\overset{Z}{\overset{|}{Si}}R'_a(OR'')_{2-a}$$

wherein X represents a divalent hydrocarbon group having from 2 to 8 carbon atoms, R represents an alkylene group having from 2 to 4 carbon atoms, n is an integer of at least 2, Z represents an organic group composed of carbon, hydrogen and oxygen and having therein at least one epoxy group, R′ represents a lower alkyl, vinyl or phenyl group, R″ represents an alkyl or an alkoxyalkyl group having less than 7 carbon atoms and a has a value of 0 or 1, the remaining silicon-bonded substituents in the organosiloxane units being selected from hydrogen atoms, monovalent hydrocarbon groups and groups represented by the general formula

$$-X(OR)_nOG$$

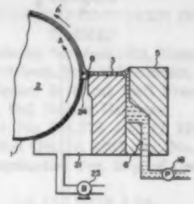
wherein X and R are as hereinabove defined and G represents a hydrogen atom, a monovalent hydrocarbon group having from 1 to 10 carbon atoms or an acyl group having from 2 to 6 carbon atoms, at least 40 percent of the total substituents bonded to siloxane silicon atoms in the copolymer being methyl groups.

6. A process for coating a substrate which comprises applying thereto an organosiloxane-oxyalkylene copolymer as defined in claim 1 and thereafter curing the applied copolymer.

4,490,417
COATING COMPOSITION
Kenji Shindow; Akimitsu Uenaka; Takaharu Izumo; Teruyoshi Fujishima, and Satoshi Yamamoto, all of Neyagawa, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan
Continuation of Ser. No. 297,974, Aug. 31, 1981, abandoned. This application May 20, 1983, Ser. No. 495,731
Claims priority, application Japan, Aug. 29, 1980, 55-120484
Int. Cl.^{3} B05D *3/02*; C08L *61/28*
U.S. Cl. 427—388.3 **19 Claims**

1. A coating composition which consists essentially of (A′) a vinylic monomer-copolymerized resin having hydroxyl groups and carboxyl groups prepared by polymerizing (1) an ethylenically unsaturated monomer having a hydroxyl group, (2) an ethylenically unsaturated monomer having a carboxyl group and (3) at least one other ethylenically unsaturated monomer copolymerizable therewith; the monomer (1) being used in an amount which can provide the thus produced solid resin with a hydroxyl value of 40 to 80 and the monomer (2) being used in an amount which can provide the produced solid resin with an acid value of 5 to 25, and having a glass transition temperature of 20 to 50° C. and a solubility parameter of 10.3 to 11.5, and (B′) an alkoxylated melamine-formaldehyde condensate, the weight proportion of the components (A′) and (B′) being from 85:15 to 60:40.

4,490,418
COATING METHOD AND APPARATUS
Toru Yoshida, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 15, 1983, Ser. No. 485,354
Claims priority, application Japan, Apr. 16, 1982, 57-63604
Int. Cl.^{3} B05D *1/26*; B05C *3/132*
U.S. Cl. 427—445 **9 Claims**



1. The method of coating an advancing web, comprising the steps of:

feeding a coating solution having a viscosity of no more than 2 cp and a surface tension not greater than 25 dyne/cm from a die block to a surface of a web so that a coating solution bead is formed between said die block and said web;

advancing said web past said solution bead so that said web travels from a lower side of said solution bead to an upper side of said solution bead; and

applying pressure to said lower side of said solution bead to create a positive pressure differential between said lower side and said upper side of said solution bead to support and stabilize said solution bead.

6. An apparatus for applying a coating solution onto a surface of a web, comprising:

a first die block;

a roll for advancing said web past an edge of said first side block, said web surface being spaced apart from said die block edge;

means for pumping said coating solution onto said die block edge to form a solution bead between said web surface and said die block edge, said web surface being transported by said roll from a lower side of said solution bead to a upper side of said solution bead; and

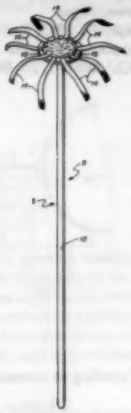
means for creating a positive pressure differential between said lower side and said upper side of said solution bead.

4,490,419
ULTRASONICALLY WELDED POMPONS
Robert F. Sliva, 807 Patchester, Houston, Tex. 77079
Filed Jun. 29, 1983, Ser. No. 508,731
Int. Cl.^{3} D04D *7/06*
U.S. Cl. 428—4 **6 Claims**

1. A pompon comprising:

an elongated gripping member;

a thermoplastic crown piece mating surface securely joined to one end of said gripping member; and



a plurality of thermoplastic streamer members which are ultrasonically fused as a mass to said mating surface.

4,490,420

MEDICAL BAG AND METHOD FOR MANUFACTURING THE SAME

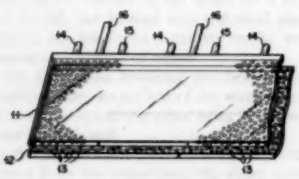
Takao Yoshida, Fujinomiya, Japan, assignor to Terumo Corporation, Tokyo, Japan

Filed Sep. 24, 1982, Ser. No. 422,943

Claims priority, application Japan, Mar. 24, 1982, 57-46779

Int. Cl.³ B65D *31/02*

U.S. Cl. 428—35 **14 Claims**



1. A medical bag comprising:

a pair of sheets which exhibit a blocking tendency at high temperatures, each of said pair of sheets having a peripheral region for heat sealing said sheets to each other; and

a discontinuous layer of separate small spots of a non-fluid, at least partially crosslinked silicone resin on at least one of two opposing surfaces of said pair of sheets including said peripheral region, and said pair of sheets being sealed to each other by heat sealing in the area of the peripheral region thereof which is not covered by said silicone resin.

4,490,421

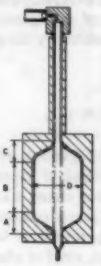
BALLOON AND MANUFACTURE THEREOF

Stanley B. Levy, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 5, 1983, Ser. No. 510,812

Int. Cl.³ A61M *29/02*

U.S. Cl. 428—35 **12 Claims**



1. High molecular weight, biaxially oriented, flexible polymeric balloon having a burst pressure of at least 200 psi (1.4 MPa) and a radial expansion of less than 5% at 200 psi (1.4 MPa).

4,490,422

CLOSURE SYSTEM FOR A SPLIT SLEEVE CONSISTING OF SHRINKABLE MATERIAL

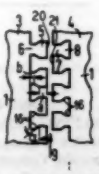
Helmut Pascher, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 30, 1982, Ser. No. 454,711

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1982, 3201108

Int. Cl.³ F16L *9/00*

U.S. Cl. 428—36 **13 Claims**



1. In a longitudinally split sleeve consisting of a shrinkable material having a first and a second longitudinally extending edge zones with edges, closure means for forming a closure system with a parting line for said edge zones, said closure means consisting of mutually engaging closure elements being disposed along the parting line in the area of each edge zone and including means for reinforcing the edge zones, the improvements comprising the first edge zone having first cutout portions extending inward from the edge of the first edge zone to create a meandrous profile with outwardly extending longitudinally spaced first projections to form the elements for the first edge zone, the second edge zone having second cutout portions extending inward from the edge of the second edge zone to create a meandrous profile with outwardly extending longitudinally spaced second projections to form the elements for the second edge zones, each of the cutout portions of the first and second edge zones having a narrow portion at the edge of the edge zone and a wider portion spaced inwardly therefrom so that each of the projections have a wide portion connected by a narrower neck portion to the rest of the sleeve,

said second cutout portions of the second edge zone being aligned with the first projections onthe first edge zone and being dimensioned with the widths of the wide portion of the projections and the wider portion of the cutout portion being the same and the widths of the neck portion and the narrow portion being the same so that the narrow portion of the cutout portion receives the neck portion of the projection when the closure means closes the split sleeve.

4,490,423

POLYURETHANE POLYENE COMPOSITIONS

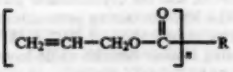
Francis E. Gould, Princeton, and Christian W. Johnston, Neshanic Station, both of N.J., assignors to Tyndale Plains-Hunter, Ltd., Princeton, N.J.

Division of Ser. No. 433,481, Oct. 8, 1982, Pat. No. 4,454,309, which is a continuation-in-part of Ser. No. 206,407, Nov. 12, 1980, Pat. No. 4,359,558. This application May 7, 1984, Ser. No. 607,677

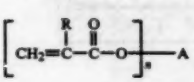
Int. Cl.³ B32B *1/08*

U.S. Cl. 428—36 **6 Claims**

1. As an article of manufacture, a three-dimensional substrate having on at least one of its surfaces a coating of a hydrophilic polyurethane polyene composition comprising from about 10 to about 50 parts by weight of a polyene selected from the group consisting of polyallyl esters having the formula:



wherein n is a whole number larger than 1 and smaller than 4, and R is the residue of a polybasic acid; and polyacrylic esters having the formula:



wherein n is a whole number larger than 2 and smaller than 7, R is hydrogen or a methyl radical and A is the residue of a polyhydric alcohol; and about 100 parts by weight of a hydrophilic polyurethane resin.

4,490,424

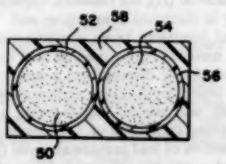
NON-STRUCTURAL AND STRUCTURAL HOT-MELT ADHESIVE AND SEALANT TAPES

Michael J. Gerace, Centerville, Ohio, assignor to Protective Treatments, Inc., Dayton, Ohio

Filed May 5, 1983, Ser. No. 491,637

Int. Cl.³ B32B *1/04, 3/14*

U.S. Cl. 428—68 **15 Claims**



1. A funicularly shaped article of manufacture comprising a core of hot-melt adhesive encased in a sheath of a plastic resin; the plastic resin sheath being one which melts, softens, volatilizes or otherwise disperses at the temperature of use of the hot-melt adhesive; the plastic resin sheath also being substantially free of any tendency to adhere to itself under light to modest pressure at ambient temperature; the plastic resin included in said sheath being compatible with the hot-melt adhesive in both its liquid and solid states.

4,490,425

FUSED AND NEEDLED NONWOVEN INTERLINING FABRIC

Jürgen Knoke, Weinheim; Manfred Jöst, Hemsbach; Bohuslav Tecl, and Erich Fahrbach, both of Weinheim, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstrasse, Fed. Rep. of Germany

Continuation of Ser. No. 274,378, Jun. 17, 1981, abandoned. This application Oct. 14, 1983, Ser. No. 541,881

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1980, 3032349

Int. Cl.³ B32B *5/06*

U.S. Cl. 428—90 **9 Claims**

1. A soft, fluffy, bulk, nonwoven fabric which comprises a nonwoven cloth of staple or endless fibers or mixtures thereof, said cloth comprising a mixture of about 10–80% of thermoplastically softenable fibers and the remainder being cofibers, the fibers of said cloth being bound together by the spot fusing of said thermoplastically softenable fibers by heating portions of said cloth to completely fuse said thermoplastically softenable fibers, said cofibers remaining unfused during said heating, said fused nonwoven cloth being punctured on at least on side with from 20–100 barbed needles per square centimeter of said cloth so as to produce a soft, fluffy surface on the side of the said nonwoven cloth from which said barbed needles emerge.

4,490,426

FIN-SHAPED CONDUCTIVE MEMBER FOR BRANCH-OFF SYSTEM

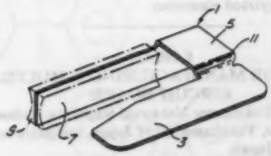
Joris R. L. Franckx, Bonheiden, Belgium, assignor to N. V. Raychem S.A., Kessel-lo, Belgium

Division of Ser. No. 311,707, Oct. 15, 1981, Pat. No. 4,410,379. This application Jul. 29, 1983, Ser. No. 518,339

Claims priority, application United Kingdom, Oct. 29, 1980, 8034755

Int. Cl.³ B32B *3/06*

U.S. Cl. 428—99 **6 Claims**



1. A thermally conductive member for use in sealing with a heat activatable sealant a branch-off between at least two substrates extending from an end of a recoverable sleeve, the member comprising a first, generally fin-shaped portion that is positionable outside said sleeve, a second elongate portion that is arranged, in use, to extend into said end of the sleeve between the substrates, and a bridging portion that interconnects said first and second portions, wherein heat applied to said first portion is conducted by the bridging portion to said second portion to effect said seal and wherein the fin-shaped portion is detachable from the second portion.

4,490,427
ADHESIVE WEBS AND THEIR PRODUCTION

Eric M. Grant, Elland, and John E. Walker, Halifax, both of England, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

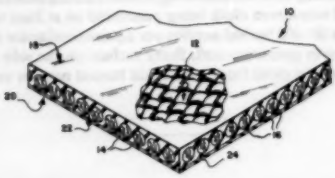
Filed Oct. 15, 1982, Ser. No. 434,473
Claims priority, application United Kingdom, Jun. 14, 1982, 8217167
Int. Cl.³ B32B 5/08
U.S. Cl. 428—107 11 Claims

1. A thermally-adhesive tape consisting essentially of a plurality of rectilinearly-oriented substantially parallel fusible polymeric filaments evenly spaced across the width of said tape, said filaments being thermally bonded to, and interconnected by, randomly-arranged polymeric fusible filaments, said randomly-arranged filaments having diameters substantially less than the diameters of said parallel filaments.

4,490,428
ELASTOMER-COATED BIAS REINFORCEMENT FABRIC AND METHOD FOR PRODUCING SAME

Delmar D. Long, Rock Hill, S.C., assignor to Dayco Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 350,969, Feb. 22, 1982,. This application Sep. 16, 1983, Ser. No. 533,098
Int. Cl.³ B32B 5/12
U.S. Cl. 428—110 8 Claims



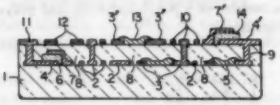
1. In an elastomer-coated, bias fabric comprising:
a bias fabric having opposed surfaces, yarns or fiber bundles, and interstices between said yarns or fiber bundles,
a layer of an uncured elastomeric composition coated on both surfaces of said fabric and penetrating said yarns or fiber bundles and said interstices, and
a tackifying agent present in at least one of said layers of said uncured elastomeric composition or in a separate layer of an uncured elastomeric composition overlying one of said layers on one surface of said fabric,
the improvement wherein said elastomeric composition containing said tackifying agent is a composition of a non-carboxylated elastomer.

4,490,429
PROCESS FOR MANUFACTURING A MULTILAYER CIRCUIT BOARD

Hiromi Tosaki, Yokohama; Nobuyuki Sugishita, Yokosuka, and Akira Ikegami, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 16, 1982, Ser. No. 398,862
Claims priority, application Japan, Jul. 24, 1981, 56-115039
Int. Cl.³ B32B 3/00
U.S. Cl. 428—195 14 Claims

1. A multilayer circuit board constituted of the following materials:
(I) an inorganic insulating material selected from the group consisting of: (i) a crystallizable glass, (ii) a mixture of an insulating crystalline oxide and non-crystallized glass having a softening point of 750° C. or below, and (iii) an insulating polycrystalline oxide, all having a sintering temperature in the range of 600°–1,000° C.;
(II) a conductive material selected from a group consisting of (i) a metal only, and (ii) a mixture of a metal and non-crystallized glass having a sintering temperature in the range of 600°–1,000° C., a softening temperature of 150°–250° C. lower than that of any inorganic insulating material selected from (I) and a coefficient of thermal expansion of 10×10^{-7}/°C. greater to 30×10^{-7}/°C. smaller than that of said inorganic insulating material;
(III) a resistor material consisting of a mixture of one conductive material selected from the group consisting of a metal, RuO_2, Rh_2O_3, IrO_2, $Bi_2Ru_2O_7$, $Pb_2Ru_2O_6$, $Bi_2Rh_2O_6$, $Pb_2Rh_2O_5$, $Bi_2Ir_2O_7$, $Pb_2Ir_2O_6$, $MoSi_2$ and CoSi and one material selected from the group consisting of: (i) the same non-crystallized glass as defined in (II)-(ii), and (ii) a crystallizable glass having a crystallization temperature of 50° higher to 50° C. lower than the sintering temperature of any inorganic insulating material selected from (I) and also having a coefficient of thermal expansion of 10×10^{-7}/°C. greater to 30×10^{-7}/°C. smaller than that of said inorganic insulating material; and
(IV) a dielectric material selected from the group consisting of: (i) an admixture of (a) a mixture, having a sintering temperature of 1,000° C. or higher, of barium titanate with one member selected from the group consisting of magnesium titanate, calcium titanate, strontium titanate, calcium zirconate, barium zirconate, nickel stannate, calcium stannate, barium oxide and lanthanum oxide, and (b) a material selected from the group consisting of: the non-crystallized glass as defined in (II)-(ii), and the crystallizable glass as defined in (III)-(ii); (ii) a lead-containing perovskite type oxide having a sintering temperature of 800°–1,000° C., and (iii) a lead-containing laminar bismuth oxide having a sintering temperature of 800°–1,000° C.;
said materials having a multilayer structure comprising:



(A) a first insulating layer consisting of said inorganic insulating material; and
(B) a first circuit disposed on a surface of said first insulating layer, said first circuit being a circuit selected from the group consisting of: (1) a first resistor circuit, having resistors of said resistor material (III) and conductors of said conductive material (II) in electrical connection; (2) a first capacitor circuit, having capacitors of said dielectric material (IV) and conductive material (II) for electrodes, and conductors of said conductive material (II), in electrical connection; and (3) a first resistor-capacitor circuit, having resistors of said resistor material (III), having capacitors of said dielectric material (IV) and conductive material (II) for electrodes, and conductors of said conductive material (II), the resistors, capacitors and conductors being in electrical connection; and
(C) a second insulating layer consisting of said inorganic insulating material (I), formed on said first circuit; and
(D) a second circuit disposed on a surface of said second insulation layer opposite the surface thereof adjacent the first circuit, said second circuit being a circuit selected from the group consisting of: (1) a second resistor circuit, having resistors of said resistor material (III) and conductors of said conductive material (II) in electrical connection; (2) a second capacitor circuit, having capacitors of said dielectric material (IV) and conductive material (II) for electrodes, and conductors of said conductive material (II), in electrical connection; and (3) a second resistor-capacitor circuit having resistors of said resistor material (III), capacitors of said dielectric material (IV) and conductive material (II) for electrodes, and conductors of said conductive material (II), the resistors, capacitors and

conductors being in electrical connection, the second insulating layer (D) having at least one through-hole filled with said material (II) extending through the second insulating layer to electrically connect said first circuit with said second circuit.

4,490,430

SELF-SUPPORTING THERMAL INK

Hugh T. Findlay, and Leonard M. Rood, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,613
Int. Cl.³ B32B *7/02, 27/34*
U.S. Cl. 428—217 **6 Claims**

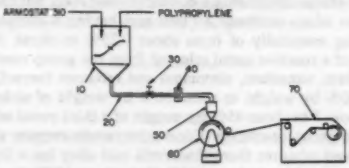
1. An ink supply of colored, solid material comprising an elongated layer at least approximately 6 microns thick flowable under heat to effect printing by a thermal printer having cohesive characteristics sufficient to permit lengthwise pulling of said ink layer as a continuous, self-supporting material to a reinking station of said printer from a location proximate to said reinking station, said layer consisting essentially of a hard, fatty acid polyamide, an elastic fatty acid polyamide, and coloring matter.

4,490,431

0.1 MICRON RATED POLYPROPYLENE MEMBRANE AND METHOD FOR ITS PREPARATION

Gunter H. Vitzthum, Candler, and Michael A. Davis, Asheville, both of N.C., assignors to Akzona Incorporated, Enka, N.C.

Filed Nov. 3, 1982, Ser. No. 438,823
Int. Cl.³ B32B *3/00;* **B29D** *27/04*
U.S. Cl. 428—220 **11 Claims**



1. A substantially skinless microporous polypropylene membrane characterized by having

(a) a bubble point of about 25 to about 50 psi;

(b) a thickness of about 3 to about 7 mils;

(c) a nitrogen flow rate of at least 0.5 liters per square centimeter-minute;

(d) a burst strength of at least 10 psi; and

(e) an S value of about 15, or less.

4,490,432

REINFORCED PAVEMENT-MARKING SHEET MATERIAL

Stanley J. Jordan, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 371,214, Apr. 23, 1982, abandoned. This application Nov. 1, 1983, Ser. No. 547,663
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—220 **17 Claims**

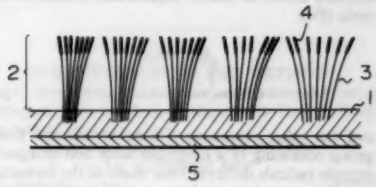
1. Pavement-marking composition in sheet form comprising 100 parts of non-crosslinked elastomer precursor, at least 5 parts of a thermoplastic reinforcing polymer which is dispersed in the elastomer as a separate phase and softens at a temperature between about 75° and 200° C., and a particulate inorganic filler dispersed in the composition; said composition being processable on calendering rolls to a thickness between about ¼ and 5 millimeters, and in sheet form having a greater tensile strength downweb than it has in the crossweb direction.

4,490,433

PROCESS FOR PRODUCING ANTISTATIC CARPET

Futami Shigeru, Ibaraki; Tajiri Koji, Mihara, and Hayashi Kazushige, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

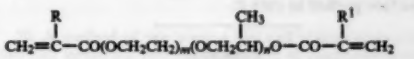
Filed May 19, 1983, Ser. No. 496,060
Claims priority, application Japan, May 24, 1982, 57-86492; May 24, 1982, 57-86493
Int. Cl.³ B05D *3/06*
U.S. Cl. 428—262 **10 Claims**

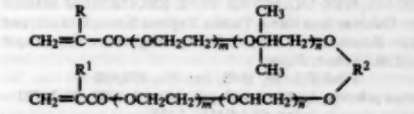


1. A process for producing an antistatic carpet, comprising:

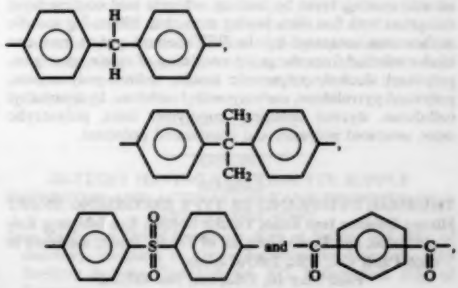
impregnating only a surface portion of a carpet with a precursory radiation curable antistatic material consisting essentially of at least one member selected from the group consisting of

(A) bi-functional compounds from the group consisting of one or both of the formulae (I) and (II):


(I)


(II)

wherein R and R^1 represent, independently from each other, a member selected from the group consisting of a hydrogen atom and a methyl radical, R^2 represents a divalent radical selected from the group consisting of those of the formulae:



wherein m and m′ represent, independently from each other, zero or an integer of from 1 to 100 and n and n′ represent, independently from each other, zero or an integer of from 1 to 200, when one of m and n is zero, the other being not zero, and when one of m′ and n′ is zero, the other being not zero, and mixtures thereof,

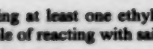
(B) mixtures of at least one bi-functional compound selected from those of the formulae (I) and (II) with at least one

compound having at least one ethylenically unsaturated bond and capable of reacting with said bi-functional compound, and

(C) mixtures of at least one mono-functional compound selected from the group consisting of those of the formula (III):

(III)

wherein one of R^3 and R^4 represents a radical of the formula (IV):



(IV)

and the other represents a member selected from the group consisting of a hydrogen atom and inorganic and organic radicals different from those of the formula (IV), m and n are as defined above, and R^5 in the formula (IV) represents a member selected from the group consisting of a hydrogen atom and a methyl radical, with at least one monomeric compound having at least two ethylenically unsaturated bonds and capable of copolymerizing with said monoacrylate compound to an extent that said precursory antistatic material penetrates into said surface portion of said carpet up to a depth of from 0.1 to 2 mm from the upper surface of said carpet; and

irradiating said precursory antistatic material in said carpet surface portion to cure it.

4,490,434

THERMAL DYE-TRANSFER TYPE RECORDING SHEET

Hiroyo Oshima; Isao Kano; Yutaka Kojima; Kazuo Harada, and Takeo Konno, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1983, Ser. No. 470,460

Claims priority, application Japan, Mar. 2, 1982, 57-31781

Int. Cl.³ B41M *5/26*

U.S. Cl. 428—341 **3 Claims**

1. Thermal-dye transfer type recording sheet having a coating layer prepared by coating on a base sheet with coating color at a coating weight of 5–15 g/m^2 with a sizing press system or coating system, said coating layer being contacted with a coloring material layer containing sublimable dye on a substrate, said coloring material being selectively transferred on said coating layer by heating, wherein said coating layer comprises both fine silica having more than 250 cm^2/g specific surface area measured by the BET-method and at least one binder selected from the group consisting of casein, guar gum, polyvinyl alcohol, polyacrylic amide, sodium polyacrylate, polyvinyl pyrrolidone, carboxymethyl cellulose, hydroxyethyl celluluose, styrene butadiene copolymer latex, polyacrylic ester, saturated polyester and unsaturated polyester.

4,490,435

THERMAL DYE-TRANSFER TYPE RECORDING SHEET

Hiroyo Oshima; Isao Kano; Yutaka Kojima; Ken Ishiguro; Koichi Nagai, and Kunio Hata, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed May 10, 1983, Ser. No. 493,365

Claims priority, application Japan, Jun. 1, 1982, 57-92136

Int. Cl.³ B41M *5/26*

U.S. Cl. 428—341 **3 Claims**

1. Thermal dye-transfer type recording sheet having a coating layer, the coating layer being contacted with a coloring material layer containing sublimable dye on a substrate, the coloring material being selectively transferred on the coating layer by heating, wherein the coating layer comprises a mixture of an amino resin and an alkyd resin at a mixing ratio by weight of said amino resin to said alkyd resin in the range from 40:60 to 60:40.

4,490,436

POLYMER FILLER PARTICLES WITH FILLER FREE COATING

Masato Kawakami, Sagamihara, and Seiji Tai, Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1982, Ser. No. 435,666

Claims priority, application Japan, Oct. 30, 1981, 56-173799

Int. Cl.³ B01J *13/02*

U.S. Cl. 428—403 **21 Claims**

1. A polymer particle admixed with a biological substance, said polymer particle consisting of:

(1) a filler selected from the group consisting of a metal, metal alloy, metal oxide, metal salt, metal sulfide, pigment and metallic chelate compound,

(2) an oleophilic surface layer upon said filler, whereby said filler does not agglomerate in an oily monomer,

(3) a layer of polymer upon said oleophilic-surfaced filler, and

(4) a layer of a filler-free polymer of an ethylenically unsaturated monomer upon the surface of the filler-containing polymer.

4,490,437

DUCTILE NICKEL BASED BRAZING ALLOY FOIL

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 20, 1982, Ser. No. 420,073

Int. Cl.³ B21H *7/00*

U.S. Cl. 428—606 **11 Claims**

1. An article comprising a ductile brazing alloy foil having a thickness of up to about 10 mils and having a composition consisting essentially of from about 0.25% to about 5% by weight of a reactive metal selected from the group consisting of titanium, vanadium, zirconium and mixtures thereof, from about 50% by weight to about 90% by weight of nickel and from about 1 to about 45% by weight of a third metal selected from the group consisting of iron, chromium, copper, molybdenum and mixtures thereof wherein said alloy has a liquidus temperature of from about 1250° C. to about 1500° C.

4,490,438

STEEL SHEET WITH MULTILAYER ELECTROPLATING AND METHOD OF PRODUCING SAME

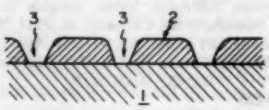
Tetsuaki Tsuda, Nishinomiya; Tatsuo Kurimoto, Wakayama, and Atsuyoshi Shibuya, Otokuni, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Feb. 2, 1983, Ser. No. 463,240

Claims priority, application Japan, Feb. 3, 1982, 57-16819; Nov. 17, 1982, 57-201427; Nov. 18, 1982, 57-203488

Int. Cl.³ C25D *5/10*

U.S. Cl. 428—613 **14 Claims**



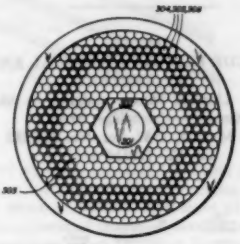
1. A steel sheet having a multilayer electroplating, which comprises on at least one side a discontinuous surface layer of an electrodeposited material selected from Fe base alloys and Fe—Zn base alloys, which contains Sn in an amount of 0.01 to 50 mg/m^2, and a layer of an electrodeposited material selected from Zn—Ni alloys and Zn—Fe alloys, which lies right under said discontinuous surface layer.

4,490,439

SUPERCONDUCTOR WITH IMPROVED PERSISTENCE CHARACTERISTICS

Zdenek J. J. Stekly, Wayland, and Bruce P. Strauss, Brookline, both of Mass., assignors to Magnetic Corporation of America, Waltham, Mass.

Filed Mar. 22, 1984, Ser. No. 592,202
Int. Cl.³ H01B 5/08
U.S. Cl. 428—614 4 Claims



1. A composite superconductive material structure comprising:

(a) a non-superconductive metal matrix; and

(b) plural superconductive filaments spaced apart in predetermined longitudinal cross section within said matrix; characterized in that

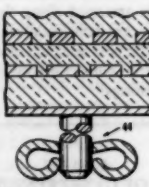
(c) a given one of said superconductive filaments being substantially larger in longitudinal cross section than are the others of said superconductive filaments, whereby substantially non-resistive connection maybe insured at joints of said composite material through registry across the joints at said substantially larger filaments.

4,490,440

HIGH TECHNOLOGY JEWELRY AND FABRICATION OF SAME

William L. Reber, 16321 Pacific Coast Hwy., #131, Pacific Palisades, Calif. 90272

Filed Aug. 16, 1983, Ser. No. 523,683
Int. Cl.³ B44D 1/52
U.S. Cl. 428—620 30 Claims



1. A decorative article of manufacture, comprising:

(a) a semiconductor substrate;

(b) a patterned coating formed on a major surface of said substrate, said patterned coating having formed therein a series of lines arranged in a variety of patterns such that incident light will be diffracted in a pleasing pattern, said lines evidencing a ratio of the line width to line spacing of about 1:1 to 3:1, with about 50 to 800 lines per millimeter; and

(c) a transparent layer formed over said patterned coating.

4,490,441

ENCAPSULATED CDTE BOULES FOR MULTIBLADE WAFERING

Thomas E. Nohava, Inver Grove Heights, and Joseph L. Schmit, Hopkins, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 6, 1982, Ser. No. 395,521
Int. Cl.³ B32B 15/00
U.S. Cl. 428—697 2 Claims

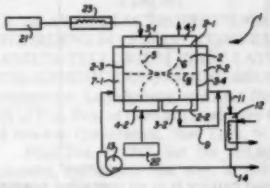
1. A cadmium telluride boule encapsulated with an encapsulant material comprising about 80% by volume of powdered beta-phase calcium sulfate hemihydrate, about 20% by volume of powdered alpha-phase calcium sulfate hemihydrate and water.

4,490,442

FUEL CELL SYSTEM AND METHOD

Hansraj C. Maru, Brookfield Center, and Mohammad Farooque, Huntington, both of Conn., assignors to Energy Research Corporation, Danbury, Conn.

Filed Jun. 23, 1983, Ser. No. 507,071
Int. Cl.³ H01M 8/04
U.S. Cl. 429—13 12 Claims



10. A method of operating a fuel cell system comprising a fuel cell including: first passage means in electrolyte-communication for conducting a first process gas through said cell; second passage means in electrolyte-communication for conducting a process gas through said cell; third passage means in electrolyte-isolation for conducting a process gas through said cell, said third passage means being in thermal communication with a heat generating surface of said cell, and first, second and third input manifold means independent of each other and communicating with said first, second and third passages means, respectively, said method comprising:

conveying said first process gas from a first supply to said first manifold means;

conveying a second process gas from a second supply to said third manifold means;

conveying a first portion of the gas passing out of the third passage means to said second input manifold means without substantial change in temperature;

and conveying a second portion of the gas passing out of the third passage means to said third input manifold means, the temperature of said second portion of gas being changed.

4,490,443

BATTERY HAVING ELECTROLYTE SUPPLY RESERVOIR AND ACTIVATION TANK DISPOSED IN A BATTERY HOUSING

Jean Ruch, and Detlef Katryniok, both of Brilon, Fed. Rep. of Germany, assignors to Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG, Brilon, Fed. Rep. of Germany

Filed Oct. 24, 1983, Ser. No. 544,604
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1982, 3239396
Int. Cl.³ H01M 12/06
U.S. Cl. 429—27 7 Claims

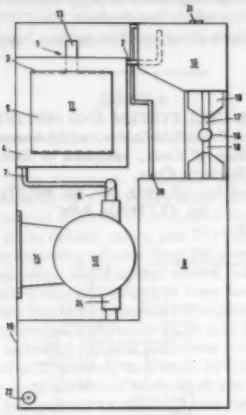
1. A battery, comprising:

a housing;

at least one cell unit disposed in said housing; each cell unit

includes a plurality of galvanic elements, each of which includes a consumable metal electrode of planar shape, and at least one gas diffusion electrode spaced from the working surface of said metal electrodes; each galvanic element also includes a receptacle into which said metal electrode extends and which supports said at least one gas diffusion electrode; each receptacle can be flushed with electrolyte, and has side walls which are flushed without exposure to air or oxygen;

a supply reservoir for electrolyte, disposed in said housing



and, when said battery is in an operating position, below said at least one cell unit;

an electrolyte activation tank disposed in said housing at least partially above the working level of electrolyte in said galvanic elements;

a closure member interposed between said supply reservoir and said electrolyte activation tank for establishing and interrupting communication therebetween;

branch lines leading to each of said receptacles; and

a pump associated with said supply reservoir and said branch lines for delivering electrolyte to each of said receptacles, and for circulating electrolyte.

4,490,444

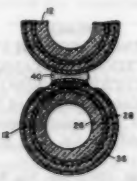
HIGH TEMPERATURE SOLID ELECTROLYTE FUEL CELL CONFIGURATIONS AND INTERCONNECTIONS

Arnold O. Isenberg, Forest Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 219,204, Dec. 22, 1980, abandoned. This application Nov. 20, 1981, Ser. No. 323,641

Int. Cl.³ H01M *8/12*

U.S. Cl. 429—31 **20 Claims**



1. A high-temperature, solid electrolyte electrochemical cell configuration comprising a plurality of axially elongated annular cells, each cell having inner and outer annular electrodes with an electrolyte therebetween, said outer electrode and electrolyte having a discontinuity containing an electrically conductive interconnect adjacent a selected segment of said inner electrode, said interconnect extending a selected axial length along each said cell,

said cells positioned adjacent one another in a series with an electrically conductive insert therebetween such that electrical contact is made, along said selected axial length, between said inner electrode of one cell and the outer electrode of the next adjacent cell.

4,490,445

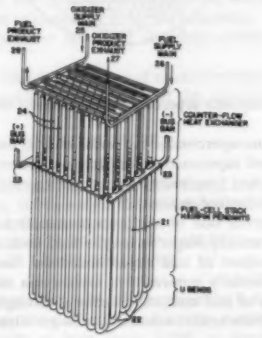
SOLID OXIDE ELECTROCHEMICAL ENERGY CONVERTER

Michael S. Hsu, Lincoln, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 24, 1982, Ser. No. 381,253

Int. Cl.³ H01M *8/12*

U.S. Cl. 429—32 **5 Claims**



1. A solid oxide electrochemical energy converter which comprises alternating layers of solid oxide electrolyte plates and electrical conductor plates, each electrolyte plate having a coating of a porous oxidizer electrode on a first surface of said electrolyte and a coating of porous fuel electrode on a second surface of said electrolyte, each conductor plate having groove networks formed by ridges to define gas passages on both surface of said conductor plate, said ridges being in electrical contact with the electrode coatings on next adjacent electrolytes and has means for tapping electricity from or introducing electricity into said converter, said conductor plates having circumferential ridges arranged along the edges of said conductor plate to define gas seals, said ridges being in contact with surface coatings on next adjacent electrolyte plates which surface coatings have the same composition as the composition forming electrode coatings.

4,490,446

PREVENTION OF OVERPRESSURIZATION OF LITHIUM-THIONYL CHLORIDE BATTERY CELLS

Glynn R. Ramsay, Dundee, Ill., and Dennis J. Salmon, Gastonia, N.C., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 17, 1982, Ser. No. 450,580

Int. Cl.³ H01M *10/34, 6/14, 6/04*

U.S. Cl. 429—57 **12 Claims**

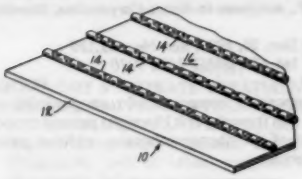
1. The method of preventing overpressurization of a lithium-thionyl chloride battery cell by formation of excessive SO_2 during high rate discharge and thereby increasing the capacity of the cell, said method comprising the step of providing powdered PCl_5 in the cathode of said cell to react with said excessive SO_2 to form soluble products.

4,490,447

BATTERY SEPARATORS

William R. Battersby, Lexington, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Apr. 6, 1984, Ser. No. 597,386
Int. Cl.³ H01M 2/16
U.S. Cl. 429—143 7 Claims



1. A battery separator carrying a plurality of polymeric ribs on at least one surface, said ribs comprising a blend of from about 75 to about 97 percent by weight of total weight of polymeric component of the rib of isotactic and atactic polypropylenes and from about 3 to about 25 percent by weight of an ethylene propylene diene terpolymer.

4,490,448

LITHIUM/COPPER OXIDE OR LITHIUM/CADMIUM OXIDE ORGANIC ELECTROLYTE CELL

Thomas R. Williamson, III, Greenacres City, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 9, 1982, Ser. No. 448,107
Int. Cl.³ H01M 6/14, 6/16, 4/36, 4/58
U.S. Cl. 429—194 2 Claims

1. A rechargeable cell comprising a lithium anode, a cadmium oxide cathode containing as a binder an ethylenepropylene copolymer or terpolymer, an electrolyte solvent selected from the group consisting of propylene carbonate and nitromethane or a mixture thereof, with a soluble salt dissolved therein which is selected from the group consisting of potassium hexafluorophosphate, lithium hexafluorophosphate and benzyl trimethylammonium hexafluorophosphate.

4,490,449

CELL SOLVENT

Peter R. Moses, Windham, and William L. Bowden, Nashua, both of N.H., assignors to Duracell Inc., Bethel, Conn

Filed Sep. 19, 1983, Ser. No. 533,684
Int. Cl.³ H01M 10/44
U.S. Cl. 429—196 11 Claims

1. A non-aqueous electrochemical cell comprising an anode comprised of an alkali or alkaline earth metal, a cathode depolarizer which provides an open circuit voltage with said anode of at least 3 volts, and an electrolyte comprised of an electrolyte salt dissolved in a non-aqueous solvent characterized in that said solvent is comprised of a substantially non-polymerizing methyl substituted 1,3 dioxolane.

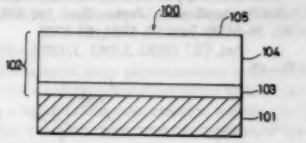
4,490,450

PHOTOCONDUCTIVE MEMBER

Isamu Shimizu; Kozo Arao, both of Yokohama, and Eiichi Inoue, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1983, Ser. No. 479,316
Claims priority, application Japan, Mar. 31, 1982, 57-53600; Mar. 31, 1982, 57-53601; Mar. 31, 1982, 57-53604; Mar. 31, 1982, 57-53605; Mar. 31, 1982, 57-53607; Mar. 31, 1982, 57-53608; Mar. 31, 1982, 57-53611; Mar. 31, 1982, 57-53612
Int. Cl.³ G03G 5/02, 5/08
U.S. Cl. 430—57 56 Claims

1. A photoconductive member comprising a support and an amorphous layer having a layer constitution comprising a first layer region comprising an amorphous material containing silicon atoms, 1–9.5×10⁵ atomic ppm of germanium atoms and 0.01–40 atomic % of at least one of hydrogen atoms and halogen atoms, and having a layer thickness of 30 Å–50μ, and a



second layer region comprising an amorphous material containing silicon atoms and 1–40 atomic % of at least one of hydrogen atoms and halogen atoms, and having a layer thickness of 0.5–90μ and exhibiting photoconductivity, said first and second layer regions being provided successively from the side of said support.

4,490,451

MULTILAYER ELECTROPHOTOGRAPHIC RECORDING MATERIAL COMPRISES A SELENIUM-TELLURIUM FIRST LAYER AND SELENIUM-ARSENIC CONTAINING SECOND LAYER

Armin Baumgaertner, Ludwigsburg, and Kurt Elsaesser, Nuremberg, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 7, 1983, Ser. No. 501,933
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1982, 3223571
Int. Cl.³ G03G 5/082
U.S. Cl. 430—57 16 Claims

1. An electrophotographic recording material comprising:
a metallic base;
a first layer disposed on said base having a thickness ranging between 20 to 60 micrometers, said first layer including selenium containing 5 to 30 percent by weight of tellurium;
a second layer disposed on said first layer having a thickness ranging between 0.5 to 3 micrometers, said second layer including a selected one of: (a) selenium containing 0.5 to 5 percent by weight of arsenic and (b) arsenic triselenide;
said tellurium content of said first layer adjacent said base being smaller than said tellurium content adjacent said second layer; and
said first layer including at least two partial layers each having a successively higher tellurium content starting with that one of said two partial layers adjacent said base.

4,490,452

XEROGRAPHIC PHOTOCONDUCTORS WITH CROSS-LINKED EPOXY BINDER

Robert B. Champ, and Yau T. Chen, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1983, Ser. No. 560,063
Int. Cl.³ G03G 5/06, 5/14
U.S. Cl. 430—58 11 Claims

1. A combined charge generating and charge transporting photosensitive layer, comprising:
a cross-linked epoxy resin binder;
at least one transport molecule; and
a charge generating molecule solubilized in an amine, which amine also acts to cross-link said epoxy.

10. An electrophotographic photoconductor whose charge generation layer comprises the layer of claim 1, and wherein a charge transfer layer is coated on the surface of the layer of claim 1.

4,490,453

PHOTOCONDUCTIVE MEMBER OF A-SILICON WITH NITROGEN

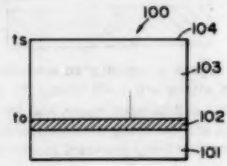
Shigeru Shirai, Yamato; Junichiro Kanbe, and Tadaji Fukuda, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,465

Claims priority, application Japan, Jan. 16, 1981, 56-5527; Jan. 16, 1981, 56-5528; Jan. 17, 1981, 56-5755

Int. Cl.³ G03G 5/082, 5/09

U.S. Cl. 430—65 **61 Claims**



1. A photoconductive member comprising a support for a photoconductive member and a layer which comprises an amorphous material having silicon atoms as matrix containing at least one of hydrogen atom and halogen atom and exhibits photoconductivity, said layer having a layer region containing nitrogen atoms in at least a part thereof, the content of the nitrogen atoms in said layer region being distributed unevenly in the direction of the thickness of said layer and substantially evenly within a plane parallel to the surface of the support, wherein the distribution profile of the content of nitrogen atoms within said layer region in the layer thickness direction has the maximum value of distribution C_{max} being 0.1 to 60 atomic %, and the total content of nitrogen atoms in the layer region is 0.02–30 atomic %.

4,490,454

PHOTOCONDUCTIVE MEMBER COMPRISING MULTIPLE AMORPHOUS LAYERS

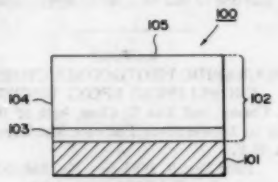
Teruo Misumi, Kawasaki; Kyosuke Ogawa, Sakurashin; Junichiro Kanbe, Yokohama; Keishi Saitoh, Yokohama; Yoichi Osato, Yokohama, and Shigeru Shirai, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1983, Ser. No. 475,250

Claims priority, application Japan, Mar. 17, 1982, 57-42400; Mar. 17, 1982, 57-42401; Mar. 17, 1982, 57-42402; Mar. 17, 1982, 57-42403

Int. Cl.³ G03C 5/08, 5/14

U.S. Cl. 430—84 **45 Claims**



1. A photoconductive member comprising a support for photoconductive member and an amorphous layer comprising an amorphous material containing silicon atoms as a matrix and containing hydrogen atoms or halogen atoms as a constituent and exhibiting photoconductivity, said amorphous layer having a first layer region containing, as constituent atoms, oxygen atoms and a second layer region containing, as constituent atoms, the atoms belonging to the group V of the periodic table in a distribution which is continuous in the direction of the layer thickness and more enriched toward the side of said support.

4,490,455

AMINE ACID SALT CHARGE ENHANCING TONER ADDITIVES

Thomas R. Hoffend, Webster, and Michelle M. Bruzee, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 20, 1982, Ser. No. 451,135

Int. Cl.³ G03G 9/08, 9/10

U.S. Cl. 430—110 **24 Claims**

1. A toner composition comprised of resin particles, and pigment particles, and from about 0.25 weight percent to about 20 weight percent of the charge enhancing additive stearyl dimethyl amine tosylate.

4,490,456

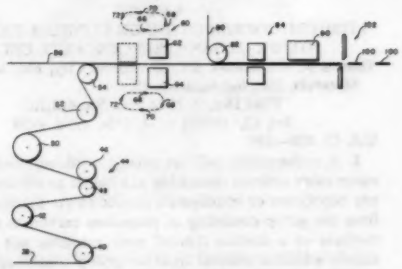
SELF-DEVELOPING PHOTOGRAPHIC FILM UNITS

Raymond D. Feasey, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,155

Int. Cl.³ G03C 5/54, 1/90, 1/96; G03D 9/02

U.S. Cl. 430—210 **9 Claims**



1. A method of manufacturing self-developing photographic film units, each such film unit including (1) an IIR sheet cut from an elongate web of material, (2) a second sheet cut from an elongate web of material, (3) a mask sheet cut from an elongate web of material and spacer means between the IIR sheet and the second sheet and serving to seal the IIR sheet and the second sheet together along opposite side margins thereof, (4) a container of processing composition, and (5) a trap having a trap spacer, the container and trap being disposed at opposite end margins of the film unit, the IIR sheet having a support, an image-receiving layer, and other layers, the IIR sheet being strippable between a portion thereof including its support and image-receiving layer bearing an image after processing and other components of the film unit including said other layers and a non-image-bearing portion of the IIR sheet overlying the container, the IIR sheet having a discontinuous slit between the image-bearing portion and the non-image-bearing portion, said method including the steps of:

(a) longitudinally slitting the IIR web into two part webs of unequal widths, the slit being discontinuous whereby the two part webs are constrained against movement relative to one another after slitting;

(b) adding containers and trap spacers at opposite margins of the IIR web; and

(c) sealing together the webs of IIR sheet material, second sheet material, and mask sheet material and the spacer means, to form a composite web of all three sheet materials and spacer means, said sealing comprising

(i) that sealing the web of mask sheet material to the web of IIR sheet material to form a composite web of mask sheet and IIR sheet materials,

(ii) heat sealing the spacer means to the web of second sheet material to form a composite web of spacer means and second sheet material, and

(iii) heat sealing the composite web of mask sheet and IIR sheet materials to the composite web of spacer means and second sheet material to form the composite web of all three sheet materials and spacer means.

4,490,457

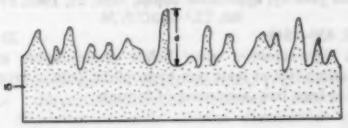
COLD/DRY SUBSTRATE TREATMENT TECHNIQUE WHICH IMPROVES PHOTOLITHOGRAPHIC LIMITS OF RESOLUTION AND EXPOSURE TOLERANCE

Vahram S. Kardashian, Plymouth, and Richard D. Benson, Minneapolis, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 210,970, Nov. 28, 1980, abandoned. This application Dec. 18, 1981, Ser. No. 332,269

Int. Cl.³ G03C 5/00

U.S. Cl. 430—311 4 Claims



1. In electronic packaging, a process for improving photolithographic limits of resolution on a ceramic substrate, the steps comprising:

providing a ceramic substrate upon which high density conductive lines are to be placed, the substrate presenting a limitation to the application of high density lines in that it inherently possesses a surface topographical variation on the order of 4–7 μm;

bonding a smoothing layer of a dry film polymer dielectric material which material is photosensitive before exposure that withstands temperatures of molten solder to at least one surface of said substrate, the surface of said layer remote from the substrate being smooth by comparison with the surface of the substrate; and

coating metal conductor lines onto the surface of said layer.

4,490,458

MULTICOLOR PHOTOGRAPHIC ELEMENTS CONTAINING SILVER IODIDE GRAINS

Gary L. House, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 451,366, Dec. 20, 1982, abandoned. This application Oct. 19, 1983, Ser. No. 543,656

Int. Cl.³ G03C 1/02, 7/26

U.S. Cl. 430—503 19 Claims

1. In a photographic element capable of producing a multicolor image comprised of

a support and, located on said support,

superimposed emulsion layers for facilitating separate recording of blue, green, and red light, each comprised of a dispersing medium and silver halide grains,

the improvement comprising

at least 50 percent of the total projected area of said silver halide grains in at least one emulsion layer being provided by thin tabular silver iodide grains having a thickness of less than 0.3 micron and an average aspect ratio of greater than 8:1.

4,490,459

MULTI-LAYERED COLOR PHOTO-SENSITIVE MATERIAL

Toshifumi Iijima, Hino; Kaoru Onodera, Odawara, and Wataru Fujimatsu, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 306,686, Sep. 29, 1981, abandoned. This application May 12, 1983, Ser. No. 493,770

Claims priority, application Japan, Oct. 3, 1980, 55-138402

Int. Cl.³ G03C 1/46

U.S. Cl. 430—505 6 Claims

1. A multi-layered color photosensitive material comprising a support, and a red-photosensitive silver halide emulsion layer containing a nondiffusion cyan coupler, a green-photosensitive silver halide emulsion layer containing nondiffusion yellow coupler and a blue-photosensitive silver halide emulsion layer containing a nondiffusion magenta coupler provided in this order on the support, said green-photosensitive silver halide emulsion layer comprising a compound which is capable of releasing a development inhibiting substance by reacting with an oxidized color developing agent.

4,490,460

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Satoru Shimbo; Yoshikazu Watanabe; Kazuo Kato, and Kiyoteshi Yamashita, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1983, Ser. No. 471,788

Claims priority, application Japan, Mar. 3, 1982, 57-34317

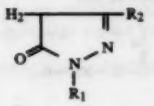
Int. Cl.³ G03C 1/46

U.S. Cl. 430—504 35 Claims

1. A multi-layer light-sensitive silver halide color photographic material, comprising:

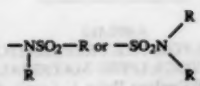
(i) a support, and

(ii) a magenta coupler containing layer on said support, said magenta coupler having the following formula I:



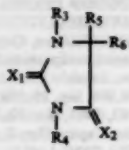
I

wherein, R_1 represents an aryl group or a heterocyclic group; and R_2 represents a benzamide group, an anilino group or a phenylureido group which contains an



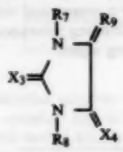
group wherein R represents a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, an amino group or a heterocyclic group;

wherein at least one layer selected from the group consisting of (1) said magenta coupler containing layer, and (2) at least one layer on said magenta coupler containing layer positioned in the direction away from said support, contains at least one compound of the following formulas IIA, IIB, IIC or IID:



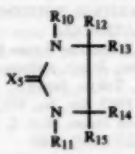
IIA

wherein X_1 and X_2 each represent oxygen or an imino group; R_3 and R_4 each represent hydrogen, an acyl group or an alkyl group; and R_5 and R_6 each represent hydrogen, a hydroxyl group, an amino group, a ureido group, an alkyl group, an aryl group, an aryloxy group, an alkoxy group, and R_5 and R_6 can be coupled to produce a 5–6 membered saturated carbocyclic nucleus;



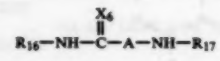
IIB

wherein, X_3 and X_4 each represent oxygen or an imino group; R_7 and R_8 each represent hydrogen, an acyl group or an alkyl group; and R_9 represents an imino group or an alkylidene group;



IIC

wherein X_5 represents oxygen or an imino group; R_{10} and R_{11} each represent hydrogen, an acyl group or an alkyl group; and R_{12}, R_{13}, R_{14} and R_{15} each represent hydrogen, a hydroxy group, an amino group, an alkyl group, an alkoxy group, an aryl group, an aryloxy group, a ureido group, and R_{12} and R_{13} or R_{14} and R_{15} can be coupled to produce 5–6 membered saturated carbocyclic nucleus; and



IID

wherein X_6 represents oxygen; R_{16} and R_{17} each represent hydrogen or an alkyl group; and A represents $—NH(CH_2)_m—NHCO—$ or $—NHCO—$ in which the terminal nitrogen atom couples to the carbon atom bonded to the X_6 group and m is 1 or 2.

4,490,461

PROCESS FOR THE PREPARATION OF PHOTOGRAPHIC MATERIALS

Terence C. Webb, Wilmslow; Peter A. Lovell, Altrincham, and Samuel B. Kingston, Wilmslow, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Jul. 11, 1983, Ser. No. 512,823

Claims priority, application United Kingdom, Jul. 23, 1982, 8221360

Int. Cl.³ G03C *1/84, 7/26, 1/02*

U.S. Cl. 430—510 **14 Claims**

1. A process for the preparation of a photographic material comprising at least one silver halide emulsion layer and which contains in at least one layer a PU compound selected from the group consisting of developing agents, colour couplers, optical brightening agents, filter dyes or acutance dyes which process comprises forming a solution of a PU compound, a compound capable of being cross-linked and a cross-linking agent for the cross-linkable compound, effecting cross-linking of the cross-linkable compound to form a cross-linked solid, isolating the solid and milling the solid to form particles of 0.1 to 0.5 μm in size, dispersing the particles in a colloid binder coating solution, coating this solution on a photobase and drying the layer.

4,490,462

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Yasushi Kawaguchi; Kiyomitsu Mine; Keiko Ide; Yukie Yamashita; Soichiro Irie, and Yotaro Hirao, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

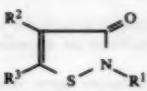
Filed Mar. 21, 1983, Ser. No. 477,130

Claims priority, application Japan, Mar. 27, 1982, 57-48130

Int. Cl.³ G03C *7/26*

U.S. Cl. 430—543 **23 Claims**

1. A light-sensitive silver halide photographic material, which comprises at least one hydrophilic colloid layer comprising at least one compound of formula:



[I]

wherein R^1 is selected from the group consisting of a hydrogen atom, a straight-chain or a branched-chain alkyl group, a straight-chain or branched chain substituted alkyl group, a cyclic alkyl group, a substituted cyclic alkyl group, an alkenyl group, a substituted alkenyl group, an aralkyl group, a substituted aralkyl group, an aryl group, a substituted aryl group, an alkylcarbamoyl group, and an arylcarbamoyl group; R^2 and R^3 each are selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group, a substituted alkyl group, a cyclic alkyl group, a substituted cyclic alkyl group, an aryl group, a substituted aryl group, a cyano group, and an alkylsulfonyl group.

4,490,463

ALKANEDIYL BRIDGED BENZIMIDAZOLO MONOMETHINE CYANINE DYES, PROCESSES FOR THEIR PREPARATION, AND PHOTOGRAPHIC EMULSIONS AND ELEMENTS CONTAINING SUCH DYES

David P. Gilbert, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,615

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—581 **11 Claims**

1. A radiation-sensitive emulsion comprised of

a dispersing medium,

silver halide grains, and

a sensitizing amount of N,N'-alkanediyl bridged benzimidazolo monomethine cyanine dye wherein at least one of the benzimidazolo nuclei are substituted with an electron-withdrawing group.

4,490,464

ELECTRODE FOR THE ELECTROCHEMICAL REGENERATION OF COENZYME, A METHOD OF MAKING SAID ELECTRODE, AND THE USE THEREOF

Lo G. Gorton, Hantverksregatan 14, S-211 55 Malmö; Hans Å. Jaegfeldt, Kämpevägen 49, S-151 54 Södertälje; Arne B. Torstensson, Vallkärra 5, S-225 90 Lund, and Gillis R. Johansson, Smäskolevägen 37, S-223 67 Lund, all of Sweden

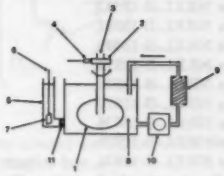
PCT No. PCT/SE82/00059, § 371 Date Dec. 2, 1982, § 102(e) Date Dec. 2, 1982, PCT Pub. No. WO82/03729, PCT Pub. Date Oct. 28, 1982

PCT Filed Mar. 8, 1982, Ser. No. 451,155

Claims priority, application Sweden, Apr. 8, 1981, 8102242

Int. Cl.³ B01D *59/40*

U.S. Cl. 435—4 9 Claims



1. An electrode for the electrochemical regeneration of coenzymes dihydronicotinamide adenine dinucleotide (NADH), dihydronicotinamide adenine dinucleotide phosphate (NADPH), or analogs thereof, characterized in that it comprises carbon or a graphitic material to the surface of which is adsorbed a condensed aromatic ring system comprising phenoxazinium ions, phenoxazinones, phenothiazinium ions or phenothiazinones, substituted or unsubstituted.

4,490,465

COUPLED ENZYME SYSTEMS FOR DETERMINATION OF DISSOLVED SUBSTANCES

Berthold Limbach, Seeheim-Jugenheim, and Roland Helger, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Mar. 25, 1983, Ser. No. 478,765

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211167

Int. Cl.³ C12Q *1/32, 1/54*

U.S. Cl. 435—14 19 Claims

1. A method for determining the amount of a substrate in solution, said substrate being capable of direct or indirect conversion catalyzed by a dehydrogenase, comprising the steps of:

(a) admixing a liquid sample containing said substrate with an enzymatic assay system comprising at least a first and second enzyme, to produce an assay solution; wherein each of said enzymes is independently capable of catalyzing the direct or indirect conversion of said substrate, said conversion in each case resulting in production of a product capable of separate direct or indirect analytical measurement or visualization; and wherein said first enzyme is a non-pyridine-linked dehydrogenase which catalyzes conversion and resultant production of a first detectable product over a first detection range, and said second enzyme is a pyridine-linked dehydrogenase which catalyzes conversion and resultant production of a second detectable product over a second, different detection range; and

(b) directly or indirectly measuring or visualizing said detectable products in said assay solution.

7. An enzymatic assay reagent system for determining the amount of a substrate in solution, said substrate being capable of direct or indirect conversion catalyzed by a dehydrogenase, comprising an admixture of at least two enzymes, each of which is independently capable of catalyzing the direct or indirect conversion of said substrate, said conversion in each case resulting in production of a product capable of separate direct or indirect analytical measurement or visualization; wherein said first enzyme is a non-pyridine-linked dehydrogenase which catalyzes conversion and resultant production of a first detectable product over a first detection range, and said second enzyme is a pyridine-linked dehydrogenase which catalyzes conversion and resultant production of a second detectable product over a second, different detection range.

4,490,466

METHOD FOR SCREENING MICROORGANISMS FOR THE PRODUCTION OF AMYLOLYTIC ENZYMES

Robert O. Horwath, Westport, Conn., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Mar. 30, 1983, Ser. No. 480,430

Int. Cl.³ C12Q *1/40, 1/04*

U.S. Cl. 435—22 7 Claims

1. A process for selecting and screening microorganisms for the production of amylolytic enzymes which comprises the steps of:

(a) forming a screening plate comprising a suspension of said microorganisms on a solid medium which promotes the growth of said microroganisms and the synthesis of amylolytic enzymes thereby;

(b) incubating said inoculated medium under anaerobic conditions for a sufficient period of time to permit the growth of a screenable sub-population of microorganisms; and

(c) identifying in situ those colonies anaerobically expressing amylolytic enzymes by detecting a zone of hydrolyzed starch surrounding each colony.

4,490,467

POLYSACCHARIDE PRODUCTION USING NOVEL STRAINS OF *PSEUDOMONAS MENDOCINA*

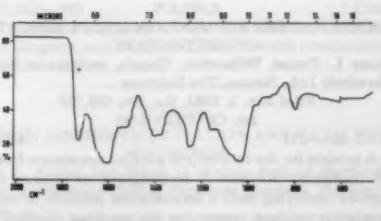
Trevor R. Jarman, Haslingfield, and Andrew J. Hacking, Reading, both of England, assignors to Kelco Biospecialties Ltd., London, England

Filed Oct. 29, 1982, Ser. No. 437,604

Claims priority, application United Kingdom, Nov. 2, 1981, 8132783

Int. Cl.³ C12P *19/04;* C12N *1/20;* C12R *1/38;* C08B *37/04*

U.S. Cl. 435—101 2 Claims



1. A biologically pure culture of a *Pseudomonas mendocina* microorganism selected from the group consisting of NCIB 11687, 11688, and 11689, said culture being capable of producing polysaccharide consisting of a partially acetylated variable block copolymer of D-mannuronic and L-guluronic acid residues in recoverable amounts by submerged, aerobic fermentation of an assimilable carbon source.

4,490,468

PRODUCTION OF ETHANOL BY YEAST USING XYLULOSE

Cheng Shang Gong; Li Fu Chen, both of West Lafayette; Michael C. Flickinger, Battle Ground, and George T. Tsao, West Lafayette, all of Ind., assignors to Purdue Research Foundation, W. Lafayette, Ind.

Filed Apr. 23, 1980, Ser. No. 143,146

Int. Cl.³ C12P 7/06

U.S. Cl. 435—161 9 Claims

1. A process for the production of ethanol which comprises fermenting xylulose under fermentative conditions at a pH ranging from 3.0 to 9.0 and a temperature ranging from about 5° to 45° C. with a yeast selected from the genus consisting of *Saccharomyces, Candida, Torula, Schizosaccharomyces, Pichia* and *Hensenula.*

4,490,469

PRODUCTION OF ETHANOL BY FERMENTATION

Kevin D. Kirby, Lower Plenty, and Christopher J. Mardon, Elsternwick, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Jan. 29, 1981, Ser. No. 229,360

Claims priority, application Australia, Jan. 30, 1980, PE2181/80; Apr. 2, 1980, PE3006/80

Int. Cl.³ C12P 7/06

U.S. Cl. 435—161 19 Claims

1. A process for the production of ethanol by solid phase fermentation of solid moist particles of a carbohydrate-containing material, comprising

(a) crushing or pulping said carbohydrate-containing material to produce, as the sole source of pulp, a pulp containing substantially no free liquid and comprising particles of said material having diameters of the range up to about 10 mm;

(b) converting non-sugar carbohydrates, if present in said material, to sugars;

(c) mixing a suspension of yeast with said pulp, the liquid portion of the suspension being absorbed by the pulp so as to leave substantially no free liquid in the mixture and fermenting said mixture by maintaining said mixture under fermentation conditions, to allow said yeast to convert sugars in said pulp to ethanol wherein said pulp during fermentation is relatively stiff in consistency and does not flow of its own accord, yet is pumpable; and

(d) extracting ethanol from said fermented pulp.

4,490,470

PROCESS FOR THE SEPARATION AND PURIFICATION OF DEXTRANASE

Anthony L. Tosoni, Willowdale, Canada, assignor to Polydex Chemicals Ltd., Nassau, The Bahamas

Filed Jan. 3, 1983, Ser. No. 455,235

Int. Cl.³ C12N 9/46

U.S. Cl. 435—211 6 Claims

1. A process for the recovery of purified dextranase from the broth containing products of fermentation of dextran which comprises clarifying such a fermentation solution to remove fermentation residues, contacting the resulting clarified solution with tannic acid in sufficient quantities to precipitate the dextranase in the form of a complex with tannic acid while maintaining the pH of the solution between 3 and 3.5, separating said complex, contacting the separated complex with a solvent for tannic acid to completely dissolve the tannic acid component of the complex, and recovering the dextranase as a dry residue.

4,490,471

MICROORGANISMS OF THE GENUS PSEUDOMONAS AND PROCESS FOR DEGRADING COMPOUNDS WHICH CONTAIN METHYL GROUPS IN AQUEOUS SOLUTIONS

Oreste Ghisalba, Basel; Franz Heinzer, Porrentruy, and Martin Küenzi, Muttenz, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 3, 1982, Ser. No. 446,736

Claims priority, application Switzerland, Dec. 11, 1981, 7933/81

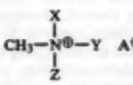
Int. Cl.³ C12N 1/20, 1/32; C07 ; C12R 1/38

U.S. Cl. 435—253 7 Claims

1. A biologically pure culture of microorganisms of the genus Pseudomonas or of Pseudomonas-type genus selected from the group of the following strains:

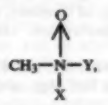
Pseudomonas NRRL-B-12582,
Pseudomonas NRRL-B-12581,
Pseudomonas NRRL-B-12580,
Pseudomonas NRRL-B-12579,
Pseudomonas NRRL-B-12578,
Pseudomonas NRRL-B-12577,
Pseudomonas NRRL-B-12576,
Pseudomonas NRRL-B-12575,
Pseudomonas NRRL-B-12574, and mutants thereof.

2. A process for the microbiological purification of aqueous solutions by degradation of lower alkanols, lower alkanoates, monosaccharides, disaccharides, methylammonium compounds of the formula



(IA)

wherein $A^{\ominus}$ is an anion, X is hydrogen or methyl, each of Y and Z is hydrogen, methyl or ethyl, with the proviso that X is hydrogen if Y and Z are ethyl, or the free amines corresponding to these salts, or methlyamine oxides of the formula



(IB)

wherein X is hydrogen or methyl and Y is hydrogen, methyl or ethyl, or mixtures of said compounds, which process comprises culturing in such an aqueous solution a microorganism of the genus Pseudomonas according to claim 1 and a mutant thereof which is able to produce biomass characterized by a multiple of the approximate empirical formula $C_5H_9NO_2$ and containing 44.67% by weight carbon, 7.04% by weight hydrogen, 10.50% by weight nitrogen, 25.00% by weight oxygen, 1.12% by weight phosphorus and 0.33% by weight sulfur (lyophilized), as well as about 8% water content, in the presence of nutrient inorganic salts and optionally of a nitrogen source, in the temperature range from about 20° to 40° C. and in a pH range from about 4 to 7.5, and, if desired, isolating the biomass obtained.

4,490,472

SENSITIVE TESTS FOR MALIGNANCIES BASED ON DNA DETECTION

A. Arthur Gottlieb, New Orleans, La., assignor to Imreg, Inc., New Orleans, La.

Filed Jun. 17, 1982, Ser. No. 389,381

Int. Cl.³ C12N 15/00; C07H 15/12; G01N 33/50

U.S. Cl. 436—504 8 Claims

1. Substantially pure DNA-L, substantially free of other DNAs.

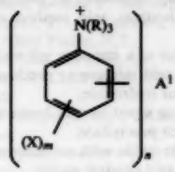
4,490,473

LABELED ANTIBODIES AND METHODS

Robert F. Brunhouse, San Jose, Calif., assignor to PanAb, Santa Clara, Calif.

Filed Mar. 28, 1983, Ser. No. 479,789
Int. Cl.³ G01N 33/54, 33/58
U.S. Cl. 436—518 11 Claims

1. A sandwich immunoassay method comprising coupling an N,N,N-trimethylammoniumphenyl substituted antibody of the formula:

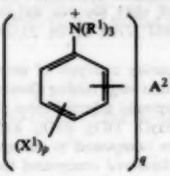


(I)

wherein

A^1 is an antibody bonded through an amino linkage thereof;
R is methyl or ethyl;
X is nitro, iodo, bromo, methoxy, carboxy or acetyl;
m is 0, 1 or 2; and
n is from 1 to 350;

with labeled antibody prepared in immunological response in a mammal to antigenic compound of the formula:



(II)

wherein

A^2 is an antigen;
R^1 is methyl or ethyl;
X^1 is nitro, iodo, bromo, methoxy, carboxy or acetyl;
p is 0, 1 or 2; and
q is from 1 to 350.

4,490,474

FUSED CAST HIGH CHROME REFRACTORY AND METHOD FOR MANUFACTURING SAME

Walter T. Staten, Port Arthur, Tex., assignor to Kennecott Corporation, Cleveland, Ohio

Filed Jun. 13, 1983, Ser. No. 503,540
Int. Cl.³ C04B 35/04, 35/12
U.S. Cl. 501—115 9 Claims

1. A fused ceramic composition consisting essentially of a solidified fusion of from about 65 to about 98 weight percent Cr_2O_3, from about 0.75 to about 4 weight percent MgO, from about 1 to about 34.25 weight percent alumina, and less than about 2 weight percent iron oxide.

4,490,475

PROCESS FOR THE PREPARATION OF SUPPORTS BASED ON MAGNESIUM CHLORIDE FOR THE PREPARATION OF CATALYSTS FOR THE POLYMERIZATION OF ALPHA-OLEFINS AND THE SUPPORTS OBTAINED

Jean C. Bailly, Martigues, and Stylianos Sandis, Lavera, both of France, assignors to BP Chimie Societe Anonyme, Courbevoie, France

Filed Jun. 16, 1983, Ser. No. 504,980
Claims priority, application France, Jun. 24, 1982, 82 11053
Int. Cl.³ C08F 4/02
U.S. Cl. 502—156 21 Claims

1. Catalyst supports for the polymerization and co-polymerization of alpha-olefins, especially ethylene and propylene, consisting essentially of magnesium chloride, characterized in that they occur in the form of spheroidal particles having a mean diameter by mass comprised between 10 and 100 microns and a narrow and controllable particle size distribution, such that the ratio of the mean diameter by mass, Dm, to the mean diameter by number, Dn, is equal to or less than 3.

7. Supports in accordance with claim 1, characterised in that in addition to magnesium chloride they comprise products having at least one Mg—C bond and an electron donor compound, and in that their density is comprised between 1.6 and 2.2.

4,490,476

CATALYST FOR THE PREPARATION OF α,β-UNSATURATED COMPOUNDS

Richard J. Piccolini, Newtown, and Michael J. Smith, Southampton, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 28, 1983, Ser. No. 508,624
Int. Cl.³ B01J 21/02, 27/14
U.S. Cl. 502—203 8 Claims

1. A supported catalyst of the formula:

$$(\text{Lewis Acid})(B_2O_3)_x(P_2O_5)_y(\text{Support})_z$$

wherein x is 0 to 1; y is 0 to 1; the sum of x plus y is 1 and Z is 0.5–999 which is prepared in the presence of a nitrogeneous material which nitrogeneous material is removed upon calcining at a temperature in the range of from 450° to about 600° C.

4,490,477

CATALYST AND REVERSE DISPROPORTIONATION PROCESS

Charles F. Hobbs, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 403,253, Jul. 29, 1982, Pat. No. 4,440,968.
This application Jan. 16, 1984, Ser. No. 571,262
Int. Cl.³ B01J 23/04, 23/46
U.S. Cl. 502—243 7 Claims

1. A catalyst comprising catalytically-effective amounts of iridium, tungsten, and an alkali or alkaline earth component on a carrier material.

4,490,478

OLEFIN DISPROPORTIONATION AND CATALYST THEREFOR

Robert L. Banks, and Simon G. Kukes, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 29, 1983, Ser. No. 518,558
Int. Cl.³ B01J 21/00, 23/34, 23/06; C07C 6/00
U.S. Cl. 502—254 8 Claims

1. A composition useful as a catalyst for the disproportionation of olefins comprising the product obtained by contacting a refractory oxide containing a metal oxide selected from the group consisting of tungsten oxide and molybdenum oxide with a promoting amount of at least one elemental metal se-

lected from the group consisting of zinc and manganese under conditions suitable for said metal to promote the activity of said metal oxide for the disproportionation reaction.

4,490,479

PROCESS FOR PREPARING CATALYSTS

Roger F. Vogel, Butler; Raymond J. Rennard, Oakmont, and Joseph A. Tabacek, New Kensington, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 19, 1983, Ser. No. 495,967

Int. Cl.³ B01J *21/04, 21/06, 23/28, 23/88*

U.S. Cl. 502—309 **14 Claims**

1. A process for preparing catalysts of increased activity which comprises in a first stage (1) in a first stage mixing alumina with at least one metal compound selected from the group consisting of TiO_2, $TiO_2.xH_2O$, Ti_2O_3, ZrO_2, $ZrO_2.xH_2O$ and WO_3 and an aqueous solution containing at least one dissolved compound therein that imparts to said aqueous solution a pH below 6 so as to place said metal compound on the surface of said alumina, the resultant product containing from 20 to 60 weight percent alumina, 0.5 to 10 weight percent of said metal compound, 30 to 75 weight percent water and 0.01 to 2 weight percent of said dissolved compound, drying the resultant product and (2) thereafter in a second stage adding to the resultant product a molybdenum compound selected from the group consisting of molybdenum oxide or a molybdenum compound capable of being converted to its oxide form during calcination.

4,490,480

NICKEL CATALYST ON ALUMINA SUPPORT

Cornelis M. Lok, Rockanje; Dirk Verzijl, Barendrecht, and Jacob van Dijk, Maassluis, all of Netherlands, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed Apr. 19, 1983, Ser. No. 486,513

Claims priority, application Netherlands, Apr. 23, 1982, 8201696

Int. Cl.³ B01J *21/04, 23/74, 23/88*

U.S. Cl. 502—315 **12 Claims**

1. A nickel upon transition alumina catalyst, containing 5 to 40 % (w/w) of nickel, characterized in that the catalyst has an active nickel surface area between 80 and 300 m^2/g Ni and in which the nickel crystallites have an average diameter of 1 to 5 nanometers.

4,490,481

SUPPORTED PALLADIUM-GOLD CATALYST, AND ITS MANUFACTURE

Jean-Paul Boitiaux, Paris, and Jean Cosyns, Maule, both of France, assignors to Sté Francaise des Produits pour Catalyse chez Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 15, 1983, Ser. No. 475,651

Claims priority, application France, Mar. 15, 1982, 82 04477

Int. Cl.³ B01J *23/58, 31/02, 27/24, 27/06*

U.S. Cl. 502—330 **20 Claims**

1. A catalyst produced by a process consisting essentially of the sequential steps of: admixing a palladium compound with an inorganic carrier, roasting in the presence of an oxygen-containing gas, treating with a reducing agent, admixing a halogenated gold compound with the resultant composition, treating with a reducing agent, washing with an aqueous solution of a compound having a basic reaction so as to lower the halogen content of the catalyst below 10 ppm by weight, and roasting in the presence of an oxygen-containing gas, the palladium and gold compounds being used in amounts such that the resultant catalyst contains 0.03 to 1% palladium and 0.003 to 0.3% gold by weight.

4,490,482

METHOD FOR PRODUCING A CATALYST FOR OXIDIZING CARBON MONOXIDE

Pierre Mathieu, Quebec, Canada, assignor to Her Majesty the Queen in right of Canada, Ottawa, Canada

Filed Oct. 25, 1983, Ser. No. 545,259

Claims priority, application Canada, Mar. 2, 1983, 422709

Int. Cl.³ B01J *23/62*

U.S. Cl. 502—339 **8 Claims**

1. A method of producing a catalyst of the type including a stannic oxide base and a coating of at least one catalyst metal selected from the group consisting of platinum, palladium, ruthenium, gold and rhodium, said method comprising the steps of:

(a) preparing a mixture of a stannous salt and stannic acid;

(b) adding a base to said mixture to produce a mixture of stannic and stannous hydroxide;

(c) adding an oxidizing agent to said hydroxide mixture to yield a stannic oxide precipitate;

(d) mixing said stannic oxide with an aqueous solution of a salt of at least one said catalyst metal;

(e) adding a reducing agent to the oxide and salt mixture to reduce the salt, whereby the catalyst metal is deposited on the stannic oxide; and

(f) drying the resulting metal coated stannic oxide.

4,490,483

PROCESS FOR PREPARING CATALYSTS

Roger F. Vogel, Butler; Raymond J. Rennard, Oakmont, and Joseph A. Tabacek, New Kensington, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 19, 1983, Ser. No. 495,966

Int. Cl.³ B01J *21/04, 21/06, 23/28*

U.S. Cl. 502—309 **21 Claims**

1. A process for preparing catalysts of increased activity which comprises (1) in a first stage mixing alumina with at least a Group IVB metal compound selected from the group consisting of TiO_2, $TiO_2.xH_2O$, TiO_2, ZrO_2, $ZrO_2.xH_2O$, and HfO_2 and a molybdenum compound in an aqueous solution containing at least one dissolved compound therein that imparts to said aqueous solution a pH below 6 so as to place said Group IVB metal compound and said molybdenum compound on the surface of said alumina, the resultant product containing from 20 to 50 weight percent alumina, 0.5 to 10 weight percent of said Group IVB metal compound, 0.1 to 10 weight percent of said molybdenum compound and 0.01 to 2 weight percent of said dissolved compound, drying and calcining the resultant product and (2) thereafter in a second stage adding to the resultant product a solution of at least one water soluble metal salt wherein the metal of said salt is selected from Groups IIA, IIIB and IVA of the Periodic Table, the metals V, Mn, Fe, Co, Ni, Cu, Zn, Sb, Bi, Cr and W, and the element Si drying and calcining the product of the second stage.

4,490,484

MEMBRANE ASSEMBLY, ELECTROCHEMICAL CELL, AND ELECTROLYSIS PROCESS USING PERFLUORINATED SANDWICH TYPE MEMBRANE

Thomas C. Bissot, Newark, and William E. Grigsby, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 21, 1981, Ser. No. 313,589

Int. Cl.³ B01J *47/12;* **B32B** *7/00*

U.S. Cl. 521—27 **13 Claims**

1. A membrane assembly which comprises two layers of perfluorinated polymer having —COOM and/or —SO_3M functional groups, where M is Na, K or H, and ion exchange capacity of at least 0.6 milliequivalents/gram, a first said layer being of polymer which has —COOM functional groups and having a thickness of 10 to 100 microns and a second said layer being of polymer which has —COOM and/or —SO_3M functional groups and having a thickness of 50 to 150 microns, and,

between said two layers, a stratum in contact with adjacent surfaces of said two layers, said stratum having a thickness from 1 to 250 microns, said stratum either (a) being water or an aqueous solution of ionic strength no greater than 5 molar, or (b) being water soluble and film forming.

4,490,485

MANUFACTURE OF FLEXIBLE POLYURETHANE FOAM CONTAINING A CONDENSATION PRODUCT OF POLYETHYLENE TEREPHTHALATE

Bruce W. Peterson; George P. Speranza, both of Austin, and Robert A. Grigsby, Jr., Georgetown, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

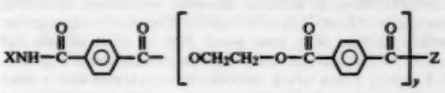
Filed Mar. 23, 1984, Ser. No. 592,653
Int. Cl.³ C08G 18/14, 18/42, 18/48
U.S. Cl. 521—48 5 Claims

1. A method for preparing a flexible polyurethane foam which comprises:

(a) reacting a polyoxypropylene polyether polyol and a condensation product of a polyoxyalkylene diamine with polyethylene terephthalate with an excess of an organic polyisocyanate in the presence of a catalyst, a blowing agent and a foam stabilizer,

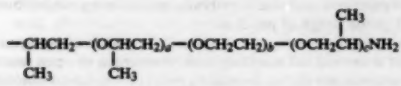
(b) said polyoxypropylene polyether polyol having a hydroxyl number between about 20 and 60, a functionality of from about 2 to about 4, a molecular weight within the range of about 2000 to about 8000 and having been prepared by reacting an initiator having a functionality between about 2 to about 4, with an alkylene oxide component consisting of from about 100 to about 80 wt.% of propylene oxide and, correspondingly, from about 20 to 0 wt.% of ethylene oxide,

(c) said condensation product having the formula:



where

X represents:



Z represents NHX or —OCH_2CH_2OH,

y is a number between about 0 and about 4,

a+c equal about 2 to 10, and

b is a number having a value of about 1 to about 50.

4,490,486

FORMALDEHYDE IMMOBILIZATION METHOD

Merlin E. Lough, Fox Island, Wash. 98333

Filed Sep. 13, 1982, Ser. No. 417,132
Int. Cl.³ C08J 9/36, 9/40
U.S. Cl. 521—53 3 Claims

1. A method of immobilizing formaldehyde in formaldehyde containing structures comprising the steps of:

preparing a gaseous mixture consisting essentially of from 1.0 to 90% penetrating/carrier gas chosen from the group consisting of helium, hydrogen, neon, argon and mixtures thereof, and from 99 to 10% ammonia by volume;

subjecting the formaldehyde containing structure to said gaseous mixture in a closed space for a time to react and immobilize said formaldehyde; and venting and exhausting the ammonia containing gaseous mixture from said closed space, whereby the level of free formaldehyde contained in said formaldehyde containing structure is reduced.

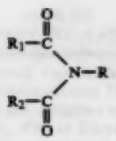
4,490,487

SO_3/IMIDE ADDUCTS, PROCESS FOR THEIR PREPARATION AND THEIR USE AS SULPHONATING AGENTS

Kurt Halcour; Peter-Michael Lange, and Rudolf Wagner, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 6, 1983, Ser. No. 558,668
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248331
Int. Cl.³ C08J 9/36
U.S. Cl. 521—53 2 Claims

1. A SO_3 adduct with an imide, which is sparingly soluble or insoluble in water, of the formula



in which R_1 and R_2, independently of one another, are an optionally substituted phenyl radical, or together form an optionally substituted 1,2-phenylene radical, an alkylene radical of the formula —$(CH_2)_m$—, in which m is 2,3 or 4, or an ethenylene radical of the formula

in which

R_3 and R_4, independently of one another, are hydrogen, halogen or C_1–C_4-alkyl, or together form a 1,4-butylene radical; and

R is an optionally substituted benzyl radical, which is bonded to a cross-linked polyethylene chain,

the imide being an imidoalkylation product of a macroporous polystyrene bead polymer cross-linked with 3 to 12% by weight of cross-linking agent.

4,490,488

SILICONE ELASTOMER FORMING COMPOSITIONS

Roger J. Cush, Cardiff, Wales, assignor to Dow Corning Limited, Barry, Wales

Filed Mar. 28, 1984, Ser. No. 594,186
Claims priority, application United Kingdom, Apr. 5, 1983, 8309230
Int. Cl.³ C08J 9/10
U.S. Cl. 521—88 10 Claims

1. A composition convertible to a silicone elastomeric foam and which comprises (A) a triorganosiloxy end-blocked polydiorganosiloxane wherein the organic substituents are selected from methyl, vinyl, phenyl and 3.3.3-trifluoropropyl groups, at least 50% of the total substituents being methyl, up to one percent of the total silicon atoms in the polydiorganosiloxane having a vinyl group attached thereto, with the proviso that there are present on average at least two vinyl groups per molecule, the viscosity of the polydiorganosiloxane falling within the range from 200 to 100,000 cP at 25° C., (B) an organohydrogensiloxane having an average more than two silicon-bonded hydrogen atoms per molecule, the organo substituents being selected from alkyl groups having from 1 to 6 carbon atoms and phenyl groups, there being sufficient organohydrogen siloxane to provide from 0.5 to 3 hydrogen atoms per vinyl group in (A), (C) a platinum compound or complex in an amount sufficient to catalyse the reaction between (A) and (B), (D) a substance which inhibits the reaction between (A) and (B) in the presence of (C), and (E) from 0.2 to 10 percent by weight, based on the total composition of a

blowing agent selected from p,p'-oxybis(benzenesulphonylhydrazide) and dinitrisopentamethylene tetramine.

4,490,489

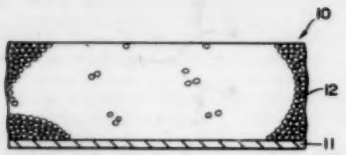
METAL CATALYZED PREPARATION OF POLYOXYALKYLENE SURFACTANTS FOR PHENOLIC FOAM STABILIZATION

Richard L. Frentzel, Clearwater, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 319,868, Nov. 9, 1981, , which is a continuation of Ser. No. 113,841, Jan. 21, 1980, abandoned. This application Mar. 2, 1984, Ser. No. 585,703

Int. Cl.³ C08J 9/14

U.S. Cl. 521—136 18 Claims



1. In the process of preparing a cellular foam from phenol aldehyde resin forming reactants and a blowing agent, the improvement which comprises utilizing as the surfactant the product of a free radical addition polymerization of a cyclic nitrogenous vinyl monomer and an esterified unsaturated dibasic acid in the presence of (a) a polyoxyalkylene adduct having the formula

H—polyoxyalkylene chain)$_t$R,

wherein R is an organic or inorganic radical and t is the number of polyoxyalkylene chains reacted onto R, (b) an organic or inorganic per-compound, and (c) a metal catalyst selected from the group consisting of ferrocene, acetylferrocene, benzoylferrocene, cobaltocene, 1,1'-diacetylferrocene, 1,1'-ferrocene-bis(diphenyl-phosphine), nickelocene, hafnocene dichloride, ferrocenecarboxaldehyde, mixtures of said ferrocene compounds and other transition metal compounds containing a metal having an atomic number of 21 to 30, and a mixture of compounds selected from the group consisting of iron (II) sulfate and iron (III) sulfate, iron (II) sulfate and iron (III) chloride, manganese (II) acetylacetonate and manganese (III) acetylacetonate, cobalt (II) benzoate and cobalt (III) acetylacetonate, copper (I) acetate and copper (II) acetylacetonate, and vanadium (III) acetylacetonate and vanadium (IV) oxide acetylacetonate, said polyoxyalkylene adduct optionally being treated either before or after said polymerization with a capping agent capable of reacting with the hydroxyl groups of said adduct to reduce the hydroxyl number of said adduct to less than 50, and the major component of said surfactant comprising the product formed from the reaction of said cyclic nitrogenous vinyl monomer and unsaturated diester onto said polyoxyalkylene adduct.

4,490,490

HIGH LOAD BEARING FLEXIBLE POLYURETHANE FOAMS

John T. Patton, Jr., Wyandotte; Thirumurti Narayan, Grosse Ile, and Louis H. Dumas, Detroit, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed May 24, 1983, Ser. No. 497,675

Int. Cl.³ C08G 65/40, 65/42

U.S. Cl. 521—177 8 Claims

1. In the process for the preparation of a flexible polyurethane foam by reacting a mixture comprising a polyol, an organic polyisocyanate, a blowing agent, a surfactant, and a catalyst for the urethane reaction, the improvement wherein the polyol component is a mixture of 95 to 75 weight percent of a polyol having a functionality of about 1.5 to about 3.0 with a hydroxyl number of about 25 to about 60 and 5 to 25 weight percent of a hydroxyl compound-modified benzyl ether-containing resole polyol obtained by the metal carboxylate catalyzed reaction at 100° C. to 130° C. of a phenol or mixture of phenols, a molar excess relative to the phenolic component of a non-aqueous aldehyde having 1 to 6 carbon atoms, and a modifying amount of an aliphatic hydroxyl compound having 1 to 4 hydroxyl groups, 1 to 12 carbon atoms, and 0 to 5 ether oxygen atoms.

4,490,491

VINYLIDENE CHLORIDE-CONTAINING COPOLYMER LATICES

James E. Devona, Mt. Prospect, and Martin L. Essigmann, Palatine, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 6, 1983, Ser. No. 539,418

Int. Cl.³ C08F 26/06

U.S. Cl. 523—318 12 Claims

1. An aqueous latex comprising an aqueous emulsion copolymer of monoethylenically unsaturated monomers consisting essentially of from 15% to 40% of vinylidene chloride together with a mixture of at least about 20% of vinyl acetate and monoethylenic acrylate or methacrylate ester with an alkanol containing from 2–8 carbon atoms providing the copolymer with a glass transition temperature in the range of −10° C. to +10° C., said monomers including from about 0.1% to 10.0% of an adhesion promoting monomer which contains a ureido hydrogen atom, said proportions being based on the total weight of monomers copolymerized.

10. A method of providing an aqueous latex characterized by superior resistance to water vapor transmission comprising, copolymerizing in aqueous emulsion monomers consisting essentially of from 15% to 40% of vinylidene chloride together with a mixture of at least about 20% of vinyl acetate and acrylic or methacrylic esters with an alkanol containing from 2–8 carbon atoms which provide the copolymer with a glass transition temperature in the range of −10° C. to +10° C., said monomers including from about 0.1% to 10.0% of an adhesion promoting monomer which contains a ureido hydrogen atom, said proportions being based on the total weight of monomers copolymerized, and said copolymerization being carried out at a pH in the range of pH 3–6.

11. A method as recited in claim 10 in which said polymerization is carried out at atmospheric pressure in an open reactor at a temperature above the boiling point of vinylidene chloride, and said vinylidene chloride is introduced into the polymerization reactor at or near the bottom thereof.

4,490,492

FLOWABLE MIXTURE AND USE OF SYNTHETIC CALCIUM SILICATE

Dieter Skudelny, Frechen, and Gerhard Rauth, Cologne, both of Fed. Rep. of Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 237,203, Feb. 23, 1981, abandoned. This application Sep. 27, 1982, Ser. No. 424,677

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006440

Int. Cl.³ C08L 63/02, 67/06, 61/06

U.S. Cl. 523—443 9 Claims

1. A flowable, liquid mixture which contains, based on the total mixture,

(a) 90 to 40% by weight of a liquid selected from the group consisting of a liquid synthetic self-crosslinkable resin, and an organic liquid curing agent,

(b) 9.5 to 59.5% by weight of a mineral filler, and

(c) 0.5 to 10% by weight of a crystalline synthetic calcium silicate, which can be in diverse stages of hydration and has a high length/width ratio and a width dimension of less than 1 μm.

4,490,493

STABILIZED BITUMINOUS BLENDS

Wayne J. Mikols, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 16, 1983, Ser. No. 562,253
Int. Cl.[3] C08L 53/00, 53/02, 95/00
U.S. Cl. 524—68 7 Claims

1. A plastic bituminous composition comprising:

(a) 100–30%w of a mixture of

(1) 40–99.8%w based on the total weight of (1), (2) and (3) of a bituminous component having a penetration of less than 800 (0.1 MM) at 25° C.;

(2) 0.1–50%w based on the total weight of (1), (2) and (3) of a thermoplastic block copolymer having at least one monoalkenyl arene polymer block and at least one elastomeric conjugated diene block B;

(3) 0.1–10.0%w based on the total weight of (1), (2) and (3) of an (ethylene-propylene)-styrene diblock copolymer

(b) 0–70%w of a filler.

4,490,494

DYEABLE POLYMER ALLOY FIBERS CONTAINING A POLYMERIC DYE-RECEPTOR AND A METAL SALT OF A CARBOXYLIC ACID

Robin D. Shropshire, Winnsboro, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 366,108, Apr. 6, 1982, abandoned, which is a continuation of Ser. No. 171,920, Jul. 24, 1980, abandoned, which is a continuation of Ser. No. 596,486, Jul. 16, 1975, abandoned, which is a continuation of Ser. No. 427,209, Dec. 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 273,619, Jul. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 207,637, Dec. 13, 1971, abandoned. This application Dec. 15, 1983, Ser. No. 562,029
Int. Cl.[3] C08L 5/09, 23/12
U.S. Cl. 524—87 32 Claims

1. A composition of matter which comprises:

(a) an alpha-monoolefin polymer;

(b) a polymeric dye receptor which when incorporated in a composition comprising said alphamonoolefin polymer improves the acid dyeability of said composition; and

(c) a Group IA metal salt of a carboxylic acid selected from the group consisting of benzoic acid, p-t-butylbenzoic acid, phenylacetic acid mellitic acid, 1,8-naphthalic acid, and o-phthalic acid.

4,490,495

COMPOSITION AND METHOD FOR TINTING PLASTIC

Hermann Weber, Tarzana, Calif., assignor to Techsight Corp., Southbridge, Mass.

Filed Nov. 15, 1982, Ser. No. 441,484
Int. Cl.[3] C08L 61/28; C08K 5/54; B29D 11/00
U.S. Cl. 524—264 11 Claims

1. A solution for coating plastic material for tinting comprising by volume, all percentages based upon the final concentrations:

(a) a first mixture of:

(1) 14.5% to 18.5% water reasonably free of dissolved solids whereby there is minimal precipitation of said solids upon addition of the other components, and

(2) 31.5% to 51.5% of a component selected from the group consisting of n-butanol, 2-butoxyethanol, and a mixture in the range of 3:1 to 1:3 by volume of:

(i) an alcohol selected from the group consisting of n-butanol and 2-butoxyethanol, and

(ii) a silane compound selected from the group consisting of glycidoxypropyltrimethoxysilane and vinyltrimethylsilane

(b) a second mixture of:

(1) 7.5% to 17.5% alkyl titanate;

(2) 11.5% to 21.5% methanol;

(3) 1.7% to 2.3% of strong inorganic acid;

(c) a third mixture of:

(1) 3% to 9% hexamethoxymethylmelamine; and

(2) 3% to 9% synthetic resin comprising urea-formaldehyde and melamine formaldehyde condensates; and

(d) 25 to 83 parts per million surfactant.

2. The solution of claim 1 wherein

said water is distilled deionized water,

said alkyl titanate is selected from the group consisting of tetraisopropyl titanate and tetrabutyl titanate,

said strong inorganic acid is selected from the group consisting of sulfuric acid, hydrochloric acid and nitric acid, and

said surfactant is selected from the group consisting of silicone glycol and fluorocarbon surfactants.

4,490,496

MOISTUREPROOF INSULATING COATING COMPOSITION FOR PACKING CIRCUIT BOARDS

Iwao Maekawa; Eiji Omori; Isao Uchigasaki; Hideyuki Tobita; Naoki Yokoyama; Seikichi Tanno; Fumio Nakano, and Ren Ito, all of Hitachi, Japan, assignors to Hitachi Chemical Co., Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Continuation of Ser. No. 256,109, Apr. 21, 1981, abandoned. This application Feb. 28, 1983, Ser. No. 470,564
Claims priority, application Japan, Apr. 21, 1980, 55-53436
Int. Cl.[3] C08K 3/34, 3/20, 5/10; C08L 33/10
U.S. Cl. 524—317 11 Claims

1. A moistureproof insulating coating composition for packing circuit boards comprising:

(A) 20 to 60 parts by weight of a thermoplastic resin having a glass transition temperature of 0° to 80° C., said thermoplastic resin being an acrylic resin obtained by polymerizing alkyl esters of acrylic acid or methacrylic acid alone or a mixture thereof, or a urethane resin;

(B) 0.01 to 1 part by weight of at least one compound selected from the group consisting of a dihydric alcohol, a trihydric alcohol, a vegetable oil having two or more hydroxyl groups in a molecule and a surface active agent having two or more hydroxyl groups in a molecule;

(C) 0.1 to 10 parts by weight of at least one thixotropic agent selected from the group consisting of powdered silicon oxide, magnesium oxide, and aluminum hydroxide; and

(D) 40 to 80 parts by weight of at least one organic solvent; said coating composition having a viscosity of 3 to 50 poises at 25° C. and a thixotropy of 2 or more.

4,490,497

COMPOSITIONS FOR SURGICAL CEMENT, BASED ON AT LEAST ONE ACRYLIC MONOMER AND AT LEAST ONE ACRYLIC POLYMER

Paul Evrard, Fourqueux; Michel Lahille, Vaubalian, and Michel Avenel, Gisors, all of France, assignors to Altulor S.A. and C.L.L. S.A.R.L., both of, France

Filed Nov. 22, 1982, Ser. No. 443,628
Claims priority, application France, Nov. 20, 1981, 81 21732
Int. Cl.[3] A61K 6/08; C08K 5/13
U.S. Cl. 524—349 10 Claims

1. A component system for forming a surgical cement comprising a powder and a liquid, wherein said powder comprises:

(a) 50 to 70 weight percent of at least one acrylic polymer having a particle size of between 20 and 150 microns; and

(b) a polymerization initiator,

and wherein said liquid comprises:

(a) 30 to 50 weight percent of a mixture comprising at least 65 weight percent of at least one acrylic monomer and up to 35 weight percent of at least one acrylic polymer;

(b) at least one polymerization activator; and

(c) from 0.05 to 1 weight percent, relative to the total amount of said acrylic monomer in said liquid, of at least one chain stopping agent chosen from the group consisting of diunsaturated monocyclic terpenes and monounsaturated bicyclic terpenes.

4,490,498

RESINOUS COMPOSITION HAVING AN INCREASED FLAME RETARDANCE

Kenichi Yokota, Ohtsu; Shigeo Nishita, Mohka, and Takashi Sakauchi, Ohtsu, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 17, 1983, Ser. No. 458,361

Claims priority, application Japan, Jan. 23, 1982, 57-9043

Int. Cl.³ C08K *5/06*

U.S. Cl. 524—371 **2 Claims**

1. A resinous molding composition having an increased flame retardance comprising

A. 10 to 60% by weight of a mixture comprising 100 parts by weight of a polyolefin resin, 20 to 60 parts by weight of decabromodiphenyl ether, 7 to 30 parts by weight of antimony trioxide and 10 to 40 parts by weight of zinc borate hydrate, and

B. 90 to 40% by weight of a magnetic ferrite powder.

4,490,499

ALUMINUM FLAKE-RESIN DISPERSIONS

Jozef T. Huybrechts, Oud Turnhout, Belgium, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US83/00209, § 371 Date Nov. 28, 1983, § 102(e) Date Nov. 28, 1983, PCT Pub. No. WO83/03420, PCT Pub. Date Oct. 13, 1983

Continuation-in-part of Ser. No. 364,926, Apr. 2, 1982, abandoned, which is a continuation-in-part of Ser. No. 254,458, Apr. 15, 1981, abandoned. This PCT application Feb. 17, 1983, Ser. No. 555,464

Int. Cl.³ C08F *5/05*

U.S. Cl. 524—376 **6 Claims**

1. In a solvent-based dispersion comprising poly(phenylene sulfide) and aluminum flakes, the improvement comprising dispersing the aluminum flakes in a mixture of ethylene glycol and ethylene glycol monobutyl ether wherein each of the ethylene glycol and ethylene glycol monobutyl ether are present in amounts of about 40–60% by weight of the two combined.

4,490,500

COMPLETELY SOLVENTLESS TWO COMPONENT RTV SILICONE COMPOSITION

Robert A. Smith, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Feb. 26, 1981, Ser. No. 238,302

Int. Cl.³ C08L *83/06*

U.S. Cl. 524—378 **16 Claims**

1. A self-bonding, soventless, room temperature vulcanizable silicone rubber composition comprising:

(1) 100 parts by weight of a first mixture comprising

(A) 83 to 98.6 parts by weight of a silanol endstopped diorganopolysiloxane polymer having a viscosity varying from 100 to 4000 centipoise at 25° C., wherein the organo groups are monovalent hydrocarbon radicals, and

(B) 1.4 to 17 parts by weight of resinous copolymer comprising $R_3SiO_{0.5}$ units and SiO_2 units, wherein R is a monovalent hydrocarbon radical and wherein said copolymer has from 0.5 to 1 $R_3SiO_{0.5}$ unit per SiO_2 unit; and

(2) 1 to 20 parts by weight of a reacted catalyst mixture comprising:

(C) 10 to 50 parts by weight of an alkyl silicate of the formula

$$(R^1)_mSi(OR^2)_{4-m}$$

and partial hydrolysis products thereof, wherein R^1 and R^2 are monovalent hydrocarbon radicals, m is 0 or 1, and which is pre-reacted

(D) 10 parts by weight of a tin salt of a carboxylic acid,

(E) 10 to 30 parts by weight of a self-bonding additive having the formula

$$E_{(3-a)}Si(R^3)_a-\theta$$

wherein R^3 is a monovalent hydrocarbon radical, E is a hydrolyzable group selected from the group consisting of alkoxy, phenoxy, amino and dialkylamino, and θ is a nitrogen functional radical which is reacted with unsaturated or aromatic hydrocarbon residue, which in addition to nitrogen functionality may be functionalized by a radical selected from the group consisting of amino, cyano, thio, oxo and ester, and combinations thereof, and a is a number varying from 0 to 2,

(F) 10 to 40 parts by weight vinyl terminated linear diorganopolysiloxane fluid having a viscosity varying from 100 to 50,000 centipoise at 25° C., wherein the organo groups are monovalent hydrocarbon radicals and wherein said diorganopolysiloxane fluid is a dispersant for filler, and

(G) 5 to 100 parts by weight of an extending filler, 1 to 50 parts by weight of a reinforcing filler, or mixture thereof.

4,490,501

COATING COMPOSITION OF A FLUOROCARBON POLYMER AND A POLYAMINE CURING AGENT

Joseph A. Vasta, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 509,703, Jun. 30, 1983,. This application Feb. 27, 1984, Ser. No. 583,976

Int. Cl.³ C07C *102/06, 103/10, 103/87*; C08K *3/10*

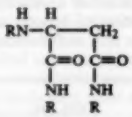
U.S. Cl. 524—413 **24 Claims**

1. A coating composition comprising about 10–70% by weight binder and 30–90% by weight of an organic solvent; wherein the binder comprises:

a fluorocarbon polymer comprising vinylidene fluoride and hexafluoropropylene having a weight average molecular weight of about 50,000–600,000,

a metallic oxide which is an acid acceptor; and

a curing agent of the formula



where R is R^1NH_2 and R^1 is aliphatic or cycloaliphatic hydrocarbon radical.

4,490,502

AGRICULTURAL PLASTIC FILM

Nobuo Fukushima, Ootsu; Kiyohiko Nakae, Nishinomiya, and Takayuki Terazawa, Shiga, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 9, 1980, Ser. No. 148,230

Claims priority, application Japan, May 15, 1979, 54-60024; May 15, 1979, 54-60025; May 15, 1979, 54-60026; Nov. 15, 1979, 54-148632

Int. Cl.³ C08K *3/34*

U.S. Cl. 524—445 **3 Claims**

1. An agricultural plastic film which comprises an olefin resin film produced by forming into a film a composition consisting essentially of 100 parts by weight of an olefin resin (A) and 2 to 25 parts by weight per 100 parts by weight of said olefin resin of an amorphous hydrated aluminum silicate gel represented by the formula:

$$(SiO_2)_x \cdot (Al_2O_3)_y \cdot nH_2O$$

wherein x and y are positive numbers such that

$0.08 \leq y/x \leq 0.33$ and n is a positive number, said aluminum silicate gel containing not less than 10% of adsorbed water at 25° C. and at a relative humidity of 65%, the ratio of the refractive index (n_A) of said olefin resin to that (n_B) of said aluminum silicate gel, n_A/n_B, being within a range of 0.99 to 1.02.

4,490,503

RAISING THE FLASH POINT OF STYRENE-CONTAINING, FREE-RADICAL CURING RESINS

John O. Goring, Kettering, England, assignor to Scott Bader Company Limited, Northamptonshire, England

Filed Nov. 15, 1983, Ser. No. 552,364

Claims priority, application United Kingdom, Nov. 17, 1982, 8232803

Int. Cl.³ C08K *5/02*

U.S. Cl. 524—462 **10 Claims**

1. An essentially liquid resin composition curable by a free radical curing mechanism and containing styrene as solvent and cross-linkable monomer and a perhalohydrocarbon capable of raising the flash point of the resin.

4,490,504

FLAME RETARDANT NON-DRIPPING POLYCARBONATE COMPOSITIONS

Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Aug. 15, 1983, Ser. No. 522,983

Int. Cl.³ C08K *3/40*

U.S. Cl. 524—537 **54 Claims**

1. Flame retardant and drip retardant halogen-free thermoplastic compositions comprised of, in physical admixture:

(i) at least one halogen-free and sulfur containing thermoplastic resin derived from

(a) at least one halogen-free, sulfur-free and non-polycyclic dihydric phenol,

(b) from about 1 to about 15 mole percent, based on the total amount of said halogen-free, sulfur-free and non-polycyclic dihydric phenol and the halogen free thiodiphenol of at least one halogen-free thiodiphenol, and

(c) a carbonate precursor; and

(ii) from about 1 to about 50 weight percent, based on the total amount of said thermoplastic resin and fibrous glass present, of fibrous glass.

4,490,505

POLYFUNCTIONAL AZIRIDINE CROSSLINKING AGENTS FOR AQUEOUS MAGNETIC RECORDING MEDIA BINDER

Daniel B. Pendergrass, Jr., Mendota Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 141,060, Apr. 17, 1980, abandoned. This application Mar. 16, 1981, Ser. No. 240,265

Int. Cl.³ C08L *75/04;* **B05D** *5/12*

U.S. Cl. 524—591 **22 Claims**

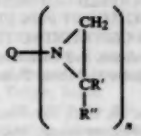
1. A method of making a magnetic recording medium comprising a backing member and a magnetizable layer, which method comprises the steps of

(1) preparing a dispersion of inorganic particles in a water-borne polymer having active-hydrogen, epoxy or epithio functional groups,

(2) adding a crosslinking agent to the dispersion, and

(3) coating the thus-modified dispersion onto the backing member, wherein the improvement comprises:

the crosslinking agent is a polyfunctional aziridine having the formula



where Q is a n-valent inorganic or aliphatic, aromatic or alicyclic organic radical, n is at least 2, and each of R′ and R″ is hydrogen or alkyl.

4,490,506

THERMOPLASTIC RESIN COMPOSITION

Hajime Sakano, Hirakata; Akitoshi Ito, Mie; Motoichi Yano, Osaka, and Yasuhiro Honda, Toyonaka, all of Japan, assignors to Sumitomo Naugatuck Co. Ltd., Japan

Filed Oct. 7, 1983, Ser. No. 539,787

Claims priority, application Japan, Oct. 7, 1982, 57-177375

Int. Cl.³ C08L *51/04, 55/02, 69/00*

U.S. Cl. 525—67 **2 Claims**

1. A thermoplastic resin composition excellent in impact resistance and moldability and improved in falling ball impact strength at a weld part which comprises (A) a polycarbonate resin having a reduced viscosity at 25° C. in chloroform of 0.40 to 0.55 and (B) a diene-rubber modified resin comprising 10 to 100% by weight of a graft polymer of a diene-rubber chosen from polybutadiene, styrene/butadiene copolymer and butadiene-acrylonitrile copolymer, with an aromatic vinyl compound and at least one of a vinyl cyanide and an alkyl unsaturated carboxylate grafted thereon and 90 to 0% by weight of a copolymer of an aromatic vinyl compound with at least one of a vinyl cyanide and an alkyl unsaturated carboxylate, said diene-rubber modified resin having apparent melt viscosities at 250° C. of 5×10^3 to 1×10^5 poise at a shear rate of 10^2 sec^{-1} and of 1.5×10^3 to 1×10^4 poise at a shear rate of 10^3 sec^{-1}, the weight proportion of the components (A) and (B) being from 20:80 to 80:20.

4,490,507

PROCESS FOR PRODUCING RUBBER MODIFIED THERMOPLASTIC RESIN

Mitsuo Abe; Hisao Nagai, both of Yokkaichi, and Akira Kamiya, Funabashi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Japan

Filed May 5, 1983, Ser. No. 491,779

Claims priority, application Japan, May 29, 1982, 57-91523

Int. Cl.³ C08F *255/06, 255/04*

U.S. Cl. 525—263 **15 Claims**

1. A process for producing a rubber-modified thermoplastic resin by graft-copolymerizing a monomeric component composed of an aromatic alkenyl compound, an alkenyl cyanide compound and a methacrylic acid ester compound on an ethylene-propylene rubber, which comprises, in the first reaction step, graft-copolymerizing a monomer mixture consisting of at least one aromatic alkenyl compound and at least one alkenyl cyanide compound or a mixture thereof with 20% by weight or less, based on the weight of said monomer mixture, of at least one other copolymerizable monomer on said ethylene-propylene rubber until the polymerization conversion of said monomer mixture reaches 30 to 70% by weight, and in the second reaction step, polymerizing a methacrylic acid ester compound or a mixture thereof with 20% by weight or less, based on all monomers added in the second step, of at least one other copolymerizable monomer in the presence of the reaction mixture obtained in the first reaction step until the polymerization reaction is substantially completed.

4,490,508

GRAFT-MODIFIED COPOLYMER AND COMPOUNDING AGENT FOR STYRENE-TYPE POLYMER CONTAINING THE SAME

Riichiro Nagano, Hiroshima, and Toshihiro Sagane, Yamaguchi, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Mar. 30, 1983, Ser. No. 480,349
Claims priority, application Japan, Mar. 30, 1982, 57-50136
Int. Cl.³ C08F 255/04, 255/06
U.S. Cl. 525—316 **6 Claims**

1. A graft-modified copolymer having a melt flow rate of 0.01 to 100 g/10 min at a temperature of 230° C. under a load of 2160 g, said graft-modified copolymer being prepared by grafting (a) 100 parts by weight of low crystalline or amorphous ethylene-alpha-olefin copolymer having an ethylene content of 40 to 93 mole%, a melt flow rate of 0.1 to 50 g/10 min at a temperature of 230° C. under a load of 2160 g, a density of 0.90 g/cm³ or less and having a crystallinity index of 0% to 50% with (b) 0.3 to 50 parts by weight of a styrene-type hydrocarbon.

4,490,509

POLY-(2,5-THIOPHENDIYL)ARSENIC PENTAFLUORIDE COMPLEXES

Gerhard Kossmehl, and Georg Chatzitheodorou, both of Berlin, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 376,590, May 10, 1982, abandoned. This application Jul. 8, 1982, Ser. No. 396,162
Claims priority, application Fed. Rep. of Germany, May 16, 1981, 3119593
Int. Cl.³ C08K 5/34; H01B 1/06
U.S. Cl. 525—328.5 **2 Claims**

1. Poly-(2,5-thiophendiyl) doped with arsenic pentafluoride.

2. A process for the production of poly-(2,5-thiophendiyl) doped with arsenic pentafluoride, wherein poly-(2,5-thiophendiyl) or 2,2'-dithienyl or thiophene or mixtures of 2,2'-dithienyl and thiophene is/are treated with gaseous arsenic pentafluoride in the absence of oxygen and moisture at +10° to +30° C. under pressures of from 0.1 mbar to atmospheric pressure.

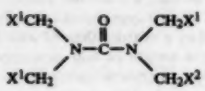
4,490,510

EPOXY CURING AGENTS, METHOD FOR MAKING THEM, METHOD OF CURING EPOXY RESINS, AND CURED EPOXY RESINS

Lowell O. Cummings, 133 Crane Dr., San Anselmo, Calif. 94960

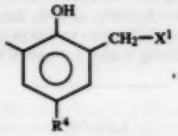
Filed Jul. 8, 1982, Ser. No. 396,319
Int. Cl.³ C08L 61/24
U.S. Cl. 525—490 **47 Claims**

1. The reaction product of epoxy resin with

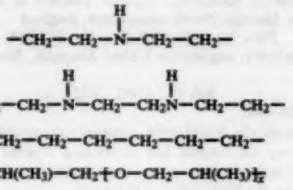


where X^1 is

and X^2 is X^1 or



where R^1 is one of the following:



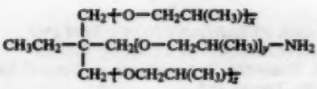
(a)

(b)

(c)

(d)

x varying from about 2 to about 6

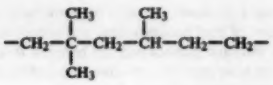


(e)

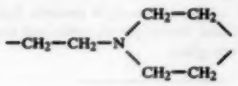
where x+y+z=about 5.3

(f)

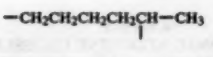
where a+c=3.5 and b=13.5



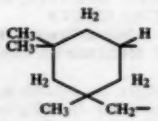
(g)



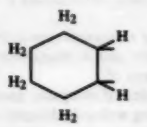
(h)



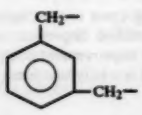
(i)



(j)

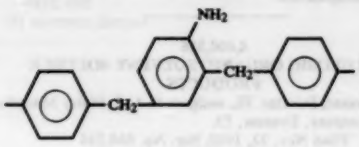


(k)



(l)

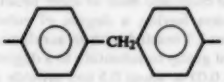
-continued



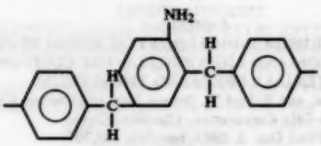
(m)

mixture of

(n)



and



$-CH_2-CH_2-CH_2-$ (o)

R^2 and R^3 are both H where R^1 is any of (a) to (l) and when R^1 is (o), either R^2 or R^3, but not both, is $C_{18}H_{35}$, while the other is H, and

R^4 is H or an alkyl radical with one to nine carbon atoms.

4,490,511

PROCESS FOR PREPARATION OF LOW-DUSTING EPOXY CURING AGENTS BASED ON TRIMELLITIC ANHYDRIDE

Simon M. Li, Houston, and Fred R. Lemley, Baytown, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 28, 1984, Ser. No. 584,429

Int. Cl.³ C08G *59/42*

U.S. Cl. 525—507 **16 Claims**

1. A low-dusting anhydride blend especially useful for curing epoxy resin compositions comprising (1) from about 1% to about 10% by weight of a normally liquid anhydride and (2) from about 90% to about 99% of a solid acid anhydride.

14. A curable composition comprising an epoxy resin and a curing amount of the composition of claim 1.

4,490,512

OLEFIN METATHESIS

Thomas J. Katz, New York, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 18, 1982, Ser. No. 442,549

Int. Cl.³ C08F *38/02*

U.S. Cl. 526—75 **4 Claims**

1. A process for polymerizing a cyclic olefin to obtain a highly chemically homogeneous (stereoselective) polymer employing phenyl acetylene as a coinitiator which comprises the steps of:

reacting said olefin with phenylacetylene, both having been passed through short columns of alumina to obtain a mixture;

distilling said mixture into an ampule containing tungsten hexachloride sealing the ampule;

heating the contents of said sealed ampule; and

dissolving the contents of said sealed ampule in methylene chloride and precipitating said highly chemically homogeneous polymer therefrom using methanol.

4,490,513

PROCESS FOR PRODUCING POLYMERS OR COPOLYMERS OF OLEFINS CONTAINING AT LEAST THREE CARBON ATOMS AND CATALYSTS THEREFOR

Syuji Minami, Ohtake; Akinori Toyota, and Norio Kashiwa, both of Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sep. 23, 1977, Ser. No. 836,056

Claims priority, application Japan, Sep. 27, 1976, 51/114631

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—128 **7 Claims**

7. A process for polymerizing an alpha-olefin having at least 3 carbon atoms comprising contacting said olefin with a catalyst prepared by mixing (A) an organoaluminum compound with (B) a solid titanium containing composition and (C) an aromatic carboxylic acid ester, said solid titanium composition being prepared by

(1) reacting an organomagnesium compound having the formula R'—Mg—R'' wherein R' is alkyl, cycloalkyl or aryl and R'' is halogen with an organic silicon-containing compound selected from the group consisting of organic silanols of the formula $R'''_xSi(OH)_{4-x}$ wherein R''' is hydrogen, vinyl, alkyl or phenyl wherein the phenyl may be substituted by lower alkyl or halogen, and at least one R''' group is other than hydrogen and x is 1, 2 or 3; and organic cyclopolysiloxanes of the formula $(Q_2SiO)_n$ wherein Q is hydrogen, hydroxyl, alkyl, cycloalkyl, aryl, alkoxy or phenoxy, wherein not all Q groups are hydrogen atoms or hydroxyl groups at the same time and n is an integer of 1 to 1,000, at a molar ratio of Mg/Si of 0.1/1 to 10/1 and then reacting the reacting of product (1) with (2) carboxylic acid ester at a molar ratio of ester/Mg of 0.01/1 to 1/1 and (3) reacting the reaction product of (2) in the hydrocarbon solvent with a titanium tetrahalide at a ratio of Ti/Mg of 0.05/1 to 1,000/1, the amount of Ti in composition (B) being about 1 to 6% by weight.

4,490,514

HIGH-TEMPERATURE ETHYLENE POLYMERIZATION AND COPOLYMERIZATION USING DIALUMINOXANE COCATALYSTS

Raymond E. Hoff, Palatine, and Thomas Pullukat, Hoffman Estates, both of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Filed Aug. 16, 1983, Ser. No. 524,012

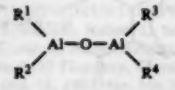
Int. Cl.³ C08F *10/02*

U.S. Cl. 526—165 **12 Claims**

1. A method of polymerizing ethylene or copolymerizing ethylene with one or more 1-olefins, said method comprising the step of polymerizing or copolymerizing said ethylene or said ethylene and 1-olefins under polymerizing conditions at a temperature greater than about 160° C. in the presence of a catalyst system comprising:

(a) a catalyst containing a catalytically active transisiton metal compound and a compound or complex of magnesium selected from the group consisting of dialkyl magnesium compounds, complexes of dialkyl magnesium and trialkyl aluminum, and organomagnesium silylamide compounds; and,

(b) a cocatalyst comprising at least one compound of the formula



wherein R^1–R^4 are the same or different alkyl groups, each having between about 1 and 12 carbon atoms and the atomic ratio of aluminum in said cocatalyst to said transition metal is between about 10 and about 300.

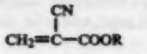
4,490,515
HOT STRENGTH CYANOACRYLATE ADHESIVE COMPOSITION

Chris S. Mariotti, and Ju-Chao Liu, both of Newington, Conn., assignors to Loctite Corporation, Newington, Conn.

Continuation of Ser. No. 246,560, Jan. 1, 1981, abandoned. This application Mar. 7, 1983, Ser. No. 473,971
Int. Cl.³ C08F 220/34
U.S. Cl. 526—298 13 Claims

1. A room temperature curing adhesive composition having improved thermal properties comprising:

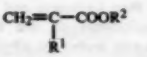
(a) at least one polymerizable cyanoacrylate monomer of the general formula



I

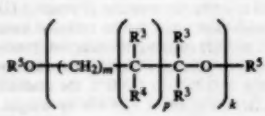
wherein R is C_{1-16} alkyl, cycloalkyl, alkenyl, cycloalkenyl, phenyl or heterocyclic radical;

(b) about 0.1 to about 20% by weight of the total composition of at least one polymerizable acrylate ester monomer of the general formula:



II

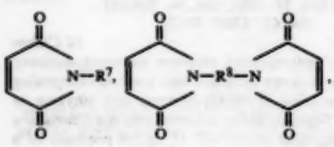
wherein R^1 is H, CH_3 or lower alkyl and R^2 is alkenyl, or

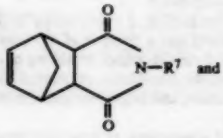


III

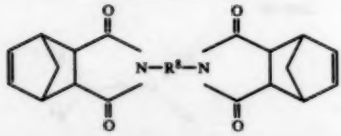
wherein R^3 is H, C_{1-4} alkyl or hydroxyalkyl or R^5OCH_2—; R^4 is H, OH or R^5O—; R^5 is CH_2=CR^6C=O; R^6 is H, halogen of C_{1-4} alkyl; m is an integer from 1 to 8, k is an integer from 1 to 20; and p is 0 or 1;

(c) about 0.1 to about 20% by weight of the total composition of an additive selected from the group consisting of





and



wherein R^7 and R^8 are selected from the group consisting of alkyl, cycloalkyl, aryalkyl, alkaryl, aryl, aryloxy and alkoxy; and

(d) an anionic polymerization inhibitor present in the amounts of about 0.1% to about 10% by weight of the total composition.

4,490,516
CELLULOSIC ORGANIC SOLVENT SOLUBLE PRODUCTS

Frank Verbanac, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Nov. 22, 1983, Ser. No. 554,216
Int. Cl.³ C08B 15/06, 15/10
U.S. Cl. 527—312 16 Claims

1. A polymerizable cellulosic ester or ether product capable of homopolymerization having a degree of substitution of between 2.0 and about 2.9 reacted with an acrylamide reactant containing a methylol group to substitute to a degree of substitution of from about 0.05 to about 0.5 and provide a hydroxyl degree of substitution of from about 0.05 to about 0.5.

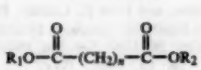
4,490,517
SOLID TDI RESIDUE-DICARBOXYLIC ESTER BINDER COMPOSITION AND LIGNOCELLULOSIC COMPOSITE MATERIALS PREPARED THEREFROM

Stephen Fuzesi, and Robert W. Brown, both of Hamden, Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Oct. 3, 1983, Ser. No. 538,705
Int. Cl.³ C08G 18/14, 18/36
U.S. Cl. 527—401 30 Claims

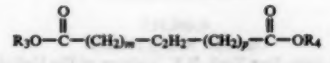
1. A solid binder composition comprising a mixture of from about 70 to about 98 percent by weight of TDI residue and correspondingly from about 2 to about 30 percent by weight of an ester derived from a dicarboxylic acid, said TDI residue being obtained from the distillation of the product of phosgenating toluene diamine to the corresponding toluene diisocyanate, and said ester being selected from the group consisting of

(a) saturated aliphatic dicarboxylic esters having the formula



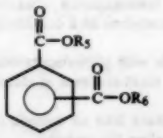
wherein R_1 and R_2 are independently selected from the group consisting of C_1–C_{20} alkyl, C_1–C_{20} haloalkyl and C_1–C_{20} alkoxy and n is an integer ranging from 1–12, inclusive;

(b) unsaturated aliphatic dicarboxylic esters having the formula



wherein R_3 and R_4 are independently selected from the group consisting of C_1–C_{20} alkyl, C_1–C_{20} haloalkyl and C_1–C_{20} alkoxy and m and p are the same and each is an integer ranging from 1–10, inclusive;

(c) aromatic dicarboxylic esters having the formula



wherein R_5 and R_6 are independently selected from the group consisting of C_1–C_{10} alkyl, C_1–C_{10} haloalkyl and C_1–C_{10} alkoxy and wherein the aromatic ring is otherwise unsubstituted or substituted with at least one member

selected from the group consisting of halo and C_1–C_4 alkyl; and

(d) mixtures thereof.

4,490,518

LIQUID ORGANIC POLYISOCYANATE-DICARBOXYLIC ESTER BINDER COMPOSITION AND LIGNOCELLULOSIC COMPOSITE MATERIALS PREPARED THEREFROM

Stephen Fuzesi, and Robert W. Brown, both of Hamden, Conn., assignors to Olin Corporation, Cheshire, Conn.

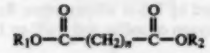
Filed Oct. 3, 1983, Ser. No. 538,712

Int. Cl.³ C08G *18/14, 18/36*

U.S. Cl. 527—401 **31 Claims**

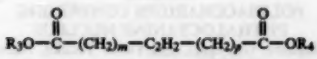
1. A liquid binder composition comprising a mixture of from about 40 to about 98 percent by weight of an organic polyisocyanate and correspondingly from about 2 to about 60 percent by weight of an ester derived from a dicarboxylic acid, said ester being selected from the group consisting of

(a) saturated aliphatic dicarboxylic esters having the formula



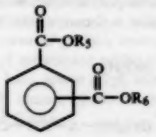
wherein R_1 and R_2 are independently selected from the group consisting of C_1–C_{20} alkyl, C_1–C_{20} haloalkyl and C_1–C_{20} alkoxy and n is an integer ranging from 1–12, inclusive;

(b) unsaturated aliphatic dicarboxylic esters having the formula



wherein R_3 and R_4 are independently selected from the group consisting of C_1–C_{20} alkyl, C_1–C_{20} haloalkyl and C_1–C_{20} alkoxy and m and p are the same and each is an integer ranging from 1–10, inclusive;

(c) aromatic dicarboxylic esters having the formula



wherein R_5 and R_6 are independently selected from the group consisting of C_1–C_{10} alkyl, C_1–C_{10} haloalkyl and C_1–C_{10} alkoxy and wherein the aromatic ring is otherwise unsubstituted or substituted with at least one member selected from the group consisting of halo and C_1–C_4 alkyl; and

(d) mixtures threof.

4,490,519

SEMI OR FULLY CONTINUOUS PROCESS FOR POLYESTER OF BISPHENOL AND DICARBOXYLIC ACID BY TRANSESTERIFICATION POLYMERIZATION AND PRODUCT THEREOF

George M. Kosanovich, Wilson, and Gideon Salee, Williamsville, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Division of Ser. No. 483,990, Apr. 11, 1983, Pat. No. 4,465,819, which is a continuation-in-part of Ser. No. 198,979, Oct. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 128,742, Mar. 10, 1980, Pat. No. 4,319,017. This application Nov. 28, 1983, Ser. No. 555,855

The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.

Int. Cl.³ C08G *63/18*

U.S. Cl. 528—179 **17 Claims**

1. In the process of preparing a linear aromatic polyester by transesterification polymerization of monomer reactants comprising a bisphenol and a diaryl ester of a dicarboxylic acid in the presence of a basic catalyst for said polymerization wherein said reactants are introduced to the polymerization reaction in the liquid state,

the improvement which comprises introducing a basic catalyst that is normally solid at 30° C., in liquid form to the polymerization reaction substantially concurrently with introduction of the liquid state reactants to the polymerization, and introducing the catalyst and reactants to the polymerization reaction substantially continuously and withdrawing the polyester product from the polymerization reaction substantially continuously, wherein the polymerization reaction is carried out in a polymerization zone which comprises a series of at least two reaction stages wherein the polymerization reaction in the final stage of the series is carried out continuously in a wiped film reaction zone followed by polymerization carried out continuously in a vented extrusion reaction zone.

4,490,520

PROCESS FOR PREPARING IMPACT-RESISTANT POLYAMIDES

Masao Ogasa, Kawachinagano; Masao Nishiyama, Takatsuki, and Kaoru Ohtsuki, Osaka, all of Japan, assignors to UBE Industries, Ltd., Osaka, Japan

Filed Feb. 24, 1983, Ser. No. 469,579

Claims priority, application Japan, Mar. 4, 1982, 57-33013

Int. Cl.³ C08G *69/20*

U.S. Cl. 528—315 **16 Claims**

1. A process for the preparation of an impact-resistant polyamide, which comprises polymerizing an ω-lactam in contact with (1) an alkali catalyst and (2) a product obtained by the reaction between (a) a polyfunctional co-catalyst used in the alkali polymerization of ω-lactam and (b) a polyoxyalkylene amine, the amount of the polyfunctional co-catalyst being such that the total number of the functional groups of the polyfunctional co-catalyst is larger than the total numbr of the amino groups of the polyoxyalkylene amine.

4,490,521

PREPARATION OF SPINNABLE POLYAMIDE FROM DINITRILE/DIAMINE/WATER WITH METAL SALT OF OXYGENATED PHOSPHORUS COMPOUND CATALYST

Gerald P. Coffey, Lyndhurst; Robert C. Sentman, Macedonia, and Benedict S. Curatolo, Maple Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 11, 1983, Ser. No. 540,596

Int. Cl.³ C08G *69/28*

U.S. Cl. 528—336 **19 Claims**

1. In a process for the manufacture of a spinnable polyamide, the process comprising contacting an α,ω-dinitrile, an α,ω-diamine, water and a catalyst at an elevated temperature and

pressure, the improvement wherein the catalyst is at least one metal salt of an oxygenated phosphorus compound.

4,490,522

PROCESS FOR PRODUCING POLYPHENYLENE SULFIDE

Juheiji Kawabata, Sakai; Toshio Inoue, Izumiohtsu; Toshinori Sugie, Takaishi, and Fumihiro Kobata, Izumi, all of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo, Japan

Filed Aug. 2, 1983, Ser. No. 519,234

Claims priority, application Japan, Aug. 4, 1982, 57-136090; Oct. 21, 1982, 57-183626; Dec. 14, 1982, 57-217765

Int. Cl.³ C08G *75/14*

U.S. Cl. 528—388 **16 Claims**

1. A process for producing polyphenylene sulfide powder or granules, which comprises reacting an alkali metal sulfide compound with a polyhalogenated phenylene compound in an organic polar solvent in contact with an oxyalkylene compound, and washing the product polyphenylene sulfide with hot water, whereby polyphenylene sulfide powder or granules, having a low content of impurities composed of electrolytic components is obtained.

4,490,523

MANDELONITRILE TRIACETYL GLUCURONATE AND PROCESS FOR PREPARING SAME

Ely J. Rubin, 5 Rav Zair, Jerusalem, Israel, and Israel Shahak, Jerusalem, Israel, assignors to Ely J. Rubin; David Rubin, both of Jerusalem, Israel and Century Science Corp., Port Washington, N.Y.

Filed Nov. 10, 1981, Ser. No. 320,086

Int. Cl.³ C07H *5/10*

U.S. Cl. 536—4.1 **4 Claims**

1. A method for the production of mandelonitrile-β-D-glucuronic acid, comprising:

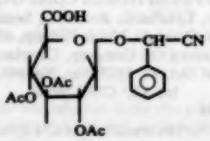
tritylating mandelonitrile-β-D-glucoside to produce mandelonitrile-β-D-trityl glucoside;

acetylating the obtained mandelonitrile-β-D-trityl glucoside to obtain mandelonitrile-β-D-triacetyl tritylglucoside;

simultaneously detritylating and oxidizing the mandelonitrile-β-D-triacetyl trityl glycoside by reacting with an oxidizing agent in the presence of an acid, under conditions and using agents sufficiently mild to obtain mandelonitrile-β-D-triacetyl glucuronic acid; and

deacetylating the obtained mandelonitrile-β-D-triacetyl glucuronic acid to obtain mandelonitrile-β-D-glucuronic acid or a salt thereof.

2. Mandelonitrile triacetyl glucuronic acid, said compound having the formula:



wherein Ac is an acetyl moiety.

4,490,524

23-O-ACYL-23-DEMYCINOSYLDESMYCOSIN DERIVATIVES

Tatsuro Fujiwara; Hideyuki Watanabe; Takao Hirano, and Hideo Sakakibara, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

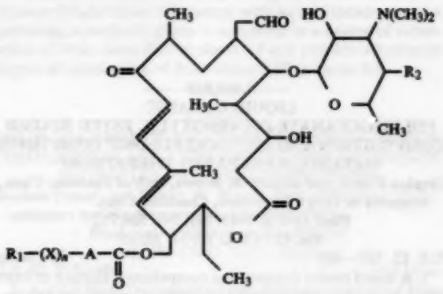
Filed Jan. 24, 1983, Ser. No. 460,443

Claims priority, application Japan, Jan. 22, 1982, 57-9396; Apr. 28, 1982, 57-71803; May 10, 1982, 57-78895

Int. Cl.³ C07H *17/08*

U.S. Cl. 536—7.1 **2 Claims**

1. A compound of the formula



wherein R_1 is optionally substituted phenyl, thienyl, 2-amino-4-thiazolyl or 2-chloroacetamido-4-thiazolyl; A is lower alkylene, lower alkenylene, or lower alkylene substituted by lower alkyl, amino, lower alkoxyimino or phenyl-Z-group wherein Z is a single bond or —S— or $—SO_2—$, but when R_1 is 2-amino-4-thiazolyl or 2-chloroacetamido-4-thiazolyl then A is lower alkylene substituted by lower alkoxyimino; R_2 is hydrogen or hydroxyl; X is oxygen or sulfur and n=0 or 1, or a non-toxic salt thereof.

4,490,525

POLYSACCHARIDES CONTAINING PHTHALOCYANINE NUCLEUS

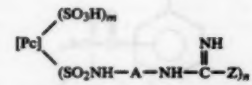
Hikoya Hayatsu, Okayama, and Yasuo Tezuka, Nara, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 1, 1982, Ser. No. 394,441

Int. Cl.³ C07B *37/00, 37/16*

U.S. Cl. 536—54 **13 Claims**

4. A method for removal of mutagens from aqueous solution, comprising adsorbing the mutagen in aqueous solution by using a phthalocyanine-polysaccharide complex represented by the formula, when it is shown as the free acid,



wherein Pc is a copper, iron, nickel, cobalt or aluminum containing or metal-free phthalocyanine residue; A is an alkylene group having 2 to 6 carbon atoms or an arylene group having 1 to 3 rings; m and n are integers satisfying both the $2<m+n\leq 4$ and $1\leq n\leq 2$ equations; and Z is an activated polysaccharide residue selected from the group consisting of agarose and dextrin.

4,490,526

METHOD FOR THE MODIFICATION OF STARCH IN THE PRESENCE OF SOLVENTS

Jürgen Amort, Troisdorf-Sieglar; Horst Hanisch, Hennef; Ute Klapdor, Troisdorf, all of Fed. Rep. of Germany; Hans P. Suerken, Zaltbommel, and Hendrikus van der Maas, Zaltichem, both of Netherlands, assignors to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Filed May 3, 1984, Ser. No. 606,709

Claims priority, application Fed. Rep. of Germany, May 5, 1983, 3316395

Int. Cl.³ C08B *31/00*

U.S. Cl. 536—102 6 Claims

1. A method of modifying starch with organosilanes comprising contacting the starch with an organofunctional alkoxysilane or an alkylalkoxysilane in an organic solvent in the presence of metallic acid esters of metals of groups IVB and VB of the Periodic Table of the Elements.

4,490,527

BENZO-FUSED HETEROCYCLIC ANTI-ULCER AGENTS

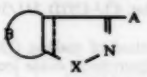
Guy A. Schiehser, Malvern, and Donald P. Strike, St. Davids, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 431,879, Sep. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 330,403, Dec. 14, 1981, abandoned. This application Feb. 22, 1983, Ser. No. 468,221

Int. Cl.³ C07D *279/12*

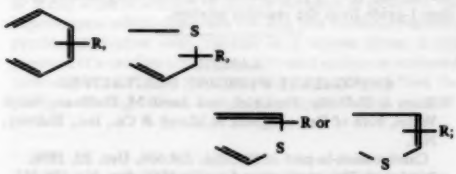
U.S. Cl. 544—62 41 Claims

1. A compound having the formula:



wherein

B is a moiety having the formula:

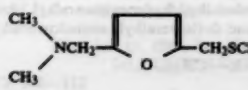


R is hydrogen, mono- or dihalo, amino, nitro, cyano, hydroxy, trifluoromethyl, mercapto, lower alkyl, lower alkoxy, alkanoyl of 2–5 carbon atoms, lowercycloalkyl, carboxy, alkoxycarbonyl of 2–7 carbon atoms, mono- or di-loweralkyl substituted amino, alkanoylamino of 2–5 carbon atoms, lower alkyl thio, loweralkylsulfonyl, sulfamoyl, lower alkyl substituted sulfamoyl, phenyl or phenyl substituted with halo, lower alkyl, lower alkoxy, trifluoromethyl, hydroxy, amino, cyano or nitro;

X is SO_2, SO, S or C=O;

and

A is an amine selected from the group:



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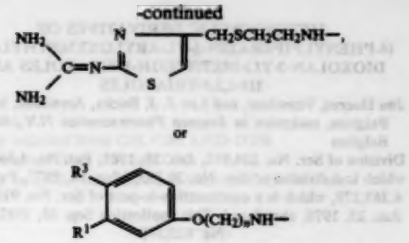


wherein R^1 is hydrogen or R^2CH_2 wherein R^2 is mono- or diloweralkylamino, mono- or di-N-loweralkylaminoloweralkyl, (2-furyl)methylamino, benzylamino, lowercycloalkylamino, 1-pyrrolidinyl, 1-piperidinyl, 1-hexahydroazepinyl, 1-octahydroazocinyl, 3-tetrahydrothiazolyl, 4-morpholinyl or 4-thiomorpholinyl; R^3 is hydrogen or (1-piperidinyl)methyl with the proviso that when R^3 is (1-piperidinyl)methyl, R^1 is hydrogen; n is 1 to 4, or a pharmacologically acceptable salt thereof.

4,490,528

PRODUCTION OF CHLORO-S-TRIAZINE TRIONES

James C. Wygant, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 1, 1983, Ser. No. 518,861

Int. Cl.³ C07D *251/28, 251/36*

U.S. Cl. 544—190 8 Claims

1. A process of producing crystalline chloro-s-triazine trione comprising: reacting cyanuric acid with an alkali metal hydroxide in water to form an aqueous reaction mixture; further reacting the aqueous reaction mixture with chlorine to form chloro-s-triazine trione; forming crystals of the chloro-s-triazine trione in the presence of an effective amount an alpha olefin sulfonate crystal modifier which contains from 4 to 20 carbon atoms; and separating the crystalline chloro-s-triazine trione from the remainder of the aqueous reaction mixture.

4,490,529

CYSTEIC ACID AND HOMOCYSTEIC ACID ANALOGUES OF METHOTREXATE AND AMINOPTERIN

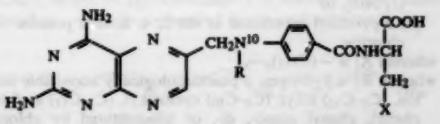
Andre Rosowsky, Needham, Mass., assignor to Dana-Farber Cancer Institute, Inc., Boston, Mass.

Filed Sep. 6, 1983, Ser. No. 529,214

Int. Cl.³ C07D *475/08*

U.S. Cl. 544—260 7 Claims

1. A compound having the following structure:



in which R is CH_3 or H and X is SO_3H or CH_2—SO_3H.

4,490,530
HETEROCYCLIC DERIVATIVES OF (4-PHENYLPIPERAZIN-1-YL-ARYLOXYMETHYL-1,3-DIOXOLAN-2-YL)-METHYL-1H-IMIDAZOLES AND 1H-1,2,4-TRIAZOLES

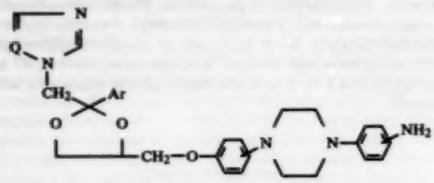
Jan Heeres, Vosselaar, and Leo J. J. Backx, Arendonk, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 224,992, Jan. 14, 1981, Pat. No. 4,368,200, which is a division of Ser. No. 20,383, Mar. 14, 1977, Pat. No. 4,267,179, which is a continuation-in-part of Ser. No. 919,333, Jun. 23, 1978, abandoned. This application Sep. 28, 1982, Ser. No. 425,370

Int. Cl.³ C07D *405/14*

U.S. Cl. 544—370 **3 Claims**

1. A chemical compound having the formula



and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is a member selected from the group consisting of CH and N;

Ar is a member selected from the group consisting of phenyl, thienyl, halothienyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy and trifluoromethyl.

4,490,531
PYRIDYL-SUBSTITUTED-BENZOFURANS

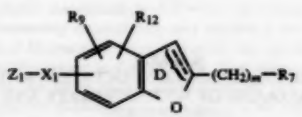
Roy A. Johnson, Brookline, Mass., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 385,622, Jun. 8, 1982, abandoned, which is a continuation-in-part of Ser. No. 279,374, Jul. 1, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 430,305

Int. Cl.³ C07D *405/06*

U.S. Cl. 546—269 **7 Claims**

1. A compound of the formula I



I

wherein Z_1 is

(a) 4-pyridinyl,

(b) 3-pyridinyl, or

(c) 3-pyridinyl substituted at the 4 position by

(1) —OCH_3,

(2) —$N(CH_3)_2$, or

(3) NH_2, or

(d) 3-pyridinyl substituted at the 2, 4, 5, or 6 position by chlorine;

wherein X_1 is —$(CH_2)_n$—,

wherein R_1 is hydrogen, a pharmacologically acceptable cation, (C_1–C_{12}) alkyl, (C_3–C_{10}) cycloalkyl, (C_7–C_{12}) aralkyl, phenyl, phenyl mono-, di-, or trisubstituted by chloro, (C_1–C_3) alkyl, or phenyl para-substituted by

(a) —NCHO—R_{25},

(b) —O—CO—R_{26},

(c) —CO—R_{24},

(d) —O—CO—(p—Ph)—R_{27}, or

(e) —CH=N—NH—CO—NH_2,

wherein R_{24} is phenyl or acetamidophenyl, R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or amino, R_{26} is methyl, phenyl, amino or methoxy; and R_{27} is hydrogen or acetamido, and wherein —(p—Ph) is 1,4-phenylene;

wherein R_7 is

(a) —CH_2OH,

(b) —$COOR_1$,

(c) —$CH_2N(R_4)_2$,

(d) —CN, or

(e) —C(O)—R_4;

wherein R_4 is

(a) hydrogen,

(b) (C_1–C_4)alkyl, or

(c) phenyl;

wherein R_9 and R_{12} are hydrogen;

wherein D represents a single or a double bond;

wherein m is an integer from 0 to 4, inclusive, and wherein n is an integer from 2 to 4, inclusive; including, pharmacologically acceptable acid addition salts thereof;

when D represents a single bond, an enantiomer or a racemic mixture of enantiomers thereof.

4,490,532
SYNTHESIS OF 2-[1-(2,5-DIMETHYLPHENYL)ETHYLSULFONYL]PYRIDINE-1-OXIDE HERBICIDE AND INTERMEDIATES THEREFOR

John W. Harris, Guelph, Canada, assignor to Uniroyal Ltd., Don Mills, Canada

Filed Jul. 28, 1980, Ser. No. 172,603

Int. Cl.³ C07D *211/54*

U.S. Cl. 546—294 **5 Claims**

1. (Step F) A method of making (IX) 2-[1-(2,5-dimethylphenyl)ethylsulfonyl]pyridine-1-oxide comprising contacting (VIII) 2-[1-(2,5-dimethylphenyl)ethylthio]pyridine-1-oxide with an alkali metal tungstate or tungstic acid and hydrogen peroxide in the presence of methanol or methanol and dichloromethane at a temperature of from 35° to 50° and thereafter recovering (IX) 2-[1-(2,5-dimethylphenyl)ethylsulfonyl]pyridine-1-oxide from the reaction mixture.

4,490,533
AMINOALKYL PYRIDINE DERIVATIVES

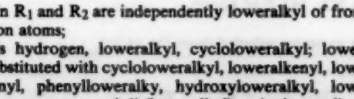
William A. Bolhofer, Frederick, and Jacob M. Hoffman, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 218,606, Dec. 22, 1980, abandoned. This application Sep. 29, 1981, Ser. No. 306,441

Int. Cl.³ C07D *211/70, 211/82, 213/24, 213/53*

U.S. Cl. 546—332 **4 Claims**

1. A compound having the formula:



wherein R_1 and R_2 are independently loweralkyl of from 1 to 3 carbon atoms;

R_3 is hydrogen, loweralkyl, cycloloweralkyl; loweralkyl substituted with cycloloweralkyl, loweralkenyl, loweralkynyl, phenylloweralky, hydroxyloweralkyl, loweralkoxy, or mono- and di-(loweralkyl) aminoloweralkyl;

Y is oxygen, or sulfur,

(A) is —$(CH_2)_n$—X—$(CH_2)_m$—;

wherein:

n is 0 or 1;

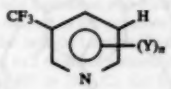
m is 2–4;
X is oxygen or sulfur
R_4 is hydrogen or loweralkyl;
R is hydrogen or loweralkyl; and the pharmaceutically acceptable salts thereof.

4,490,534
PROCESS FOR PRODUCING 3-CHLORO-5-TRIFLUOROMETHYLPYRIDINES

Kanichi Fujikawa; Yasuhiro Tsujii; Itaru Shigehara, all of Moriyama; Tatsuo Isogai, Yookaichi; Hiroshi Yoshizawa, Tokyo, and Mikio Miyaji, Shiga, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

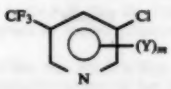
Filed Oct. 14, 1982, Ser. No. 434,368
Claims priority, application Japan, Nov. 4, 1981, 56-176759
Int. Cl.³ C07D *211/72, 211/84, 213/61*
U.S. Cl. 546—345 **14 Claims**

1. In a process for producing a 3-chloro-5-trifluoromethylpyridine derivative which comprises reacting a 5-trifluoromethylpyridine derivative having a hydrogen atom at the 3-position with chlorine, said 5-trifluoromethylpyridine derivative having the formula (I)



(I)

where Y is a chlorine atom or a fluorine atom and n is 0, 1 or 2, and when n is 2, Y may be the same or different, and said 3-chloro-5-trifluoromethylpyridine derivative having the formula (II)



(II)

where Y is a chlorine atom or a fluorine atom and m is 0, 1, 2 or 3, and when m is 2 or 3, Y may be the same or different, the improvement which comprises reacting said 5-trifluoromethylpyridine derivative with chlorine in a vapour phase in the presence of a catalyst comprising activated carbon or activated carbon with a chloride of a metal element selected from the group consisting of iron, antimony, copper and zinc.

4,490,535
4-(3- AND 4-CHLOROCYCLOHEX-3-ENYL)PYRIDINE INTERMEDIATES

Thomas J. Walter, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 300,046, Sep. 8, 1981, Pat. No. 4,405,792. This application Jun. 20, 1983, Ser. No. 479,259
Int. Cl.³ C07D *213/26*
U.S. Cl. 546—346 **3 Claims**

1. In admixture the compounds, 4-(4-chlorocyclohex-3-enyl)pyridine and 4-(3-chlorocyclohex-3-enyl)pyridine.

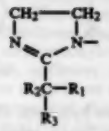
4,490,536
SALT FREE PHOSPHOBETAINES

Miguel Corti, Hawthorne, and Raymond L. Mayhew, Summit, both of N.J., assignors to Mona Industries, Inc., Paterson, N.J.

Filed Jul. 11, 1983, Ser. No. 512,757
Int. Cl.³ C07F *9/65*
U.S. Cl. 548—112 **23 Claims**

1. A phosphobetaine compound of the formula

wherein
A is selected from OH, OM AND OYR
B selected from OH and OM
R is an imidazoline reactant moiety of the formula



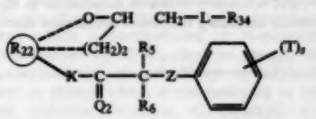
wherein
R_3 is alkyl, alkenyl, alkoxy, hydroxyalkyl or hydroxyalkenyl of from 2 to 20 carbon atoms each or aryl or alkylaryl or cycloaliphatic of up to 20 carbon atoms,
R_1 and R_2 are individually selected from hydrogen, propionic acid, propionitrile, propionamide, propionate esters of C_1–C_{12} alkyl, alkylaryl or alkylcycloaliphatic or alkali metal or alkaline earth metal salts or amine salts of propionic acid with the proviso that at least one of R_1 and R_2 must be a propionate derivative,
Y is alkylene of 2 to 6 carbon atoms optionally interrupted by up to 3 oxygen atoms, of up to 12 carbon atoms,
M is selected from alkali metals, alkaline earth metals and amines.

4,490,537
ENLARGED-HETERO-RING PROSTACYCLIN ANALOGS

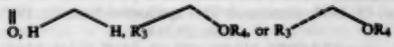
Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 904,781, May 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 788,143, Apr. 19, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 24,213
Int. Cl.³ C07D *311/94, 407/06*; A61K *31/35, 31/41*
U.S. Cl. 548—252 **76 Claims**

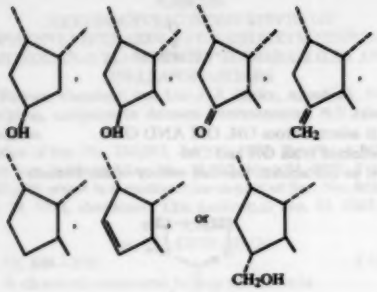
1. A cyclic ether of the formula



wherein L is (1) $-(CH_2)_d-$ wherein d is one to 5, inclusive, (2) $-(CH_2)_t-CF_2-$ wherein t is one, 2, or 3, (3) —CH=CH—, or (4) $-CH_2-O-CH_2-Y-$ wherein Y is a valence bond or $-(CH_2)_k-$ wherein k is one or 2; wherein Q_2 is



wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and wherein R_4 is hydrogen; wherein R_{22} is

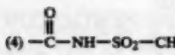


wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the provise that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 6 carbon atoms, inclusive between —CR_5R_6— and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_7— wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; wherein R_{34} is

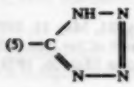
(1) —CH_2OH

(2) —$CH_2N(R_{18})_2$

(3) —C—N(R_{18})$_2$



(4) —C—NH—SO_2—CH_3 or



(5)

wherein R_{18} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different, wherein X is cis- or trans—CH=CH—, —C≡C—, or —CH_2CH_2—; and wherein ~ indicates attachment in alpha or beta configuration; including the lower alkanoates thereof.

4,490,538

ENLARGED-HETERO-RING PROSTACYCLIN ANALOGS

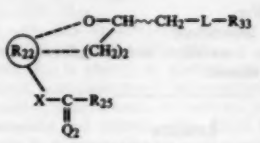
Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 904,781, May 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 788,143, Apr. 19, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 25,314

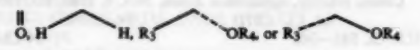
Int. Cl.[3] **C07D** *311/94, 407/06;* **A61K** *31/35, 31/41*

U.S. Cl. 548—252 **76 Claims**

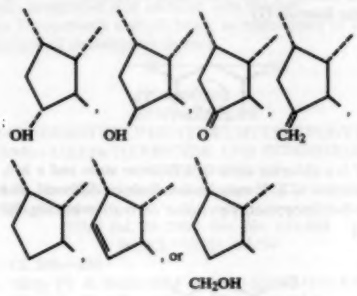
1. A cyclic ether of the formula



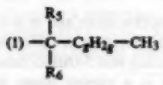
wherein L is (1) —$(CH_2)_d$— wherein D is one to 5, inclusive, (2) —$(CH_2)_t$—CF_2— wherein t is one, 2, or 3, (3) —CH=CH—, or (4) —CH_2—O—CH_2—Y— wherein Y is a valence bond or —$(CH_2)_k$— wherein k is one or 2; wherein Q_2 is



wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and wherein R_4 is hydrogen; wherein (R_{22}) is

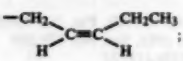


wherein R_{25} is



(1)

wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between —CR_5R_6— and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro; or

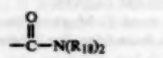


(2)

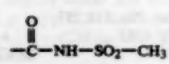
wherein R_{33} is

—CH_2OH (1)

—$CH_2N(R_{18})_2$ (2)



(3)



(4)

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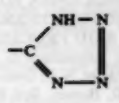


(5)

wherein R_{18} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different, wherein X is cis- or trans-CH=CH—, —C≡C—, or —CH_2CH_2—; and wherein ~ indicates attachment in alpha or beta configuration; including the lower alkanoates thereof.

4,490,539

PROCESS FOR THE PREPARATION OF 1,2,4-TRIAZOLE

János Bésán; Miklós Kovacs; László Kulcsár; Ferenc Maier, and József Pernyeszi, all of Veszprém, Hungary, assignors to Nehezvegyipari Kutato Intezet, Veszprem, Hungary

Filed Jun. 22, 1982, Ser. No. 390,863

Int. Cl.³ C07D *249/08*

U.S. Cl. 548—262 7 Claims

1. A process for the preparation of 1,2,4-triazole by reacting hydrazine, formic acid and formamide and/or ammonia characterized in that said hydrazine and formic acid or their aqueous solutions are reacted in the presence of formamide and/or ammonia in a molar ratio of 1 mole of hydrazine to 1 to 3 moles of formic acid to 1 to 2 moles of formamide and/or ammonia at a temperature of 140° to 220° C., the formed 1,2,4-triazole is recovered from the reaction mixture in a known manner and optionally the reagents used in excess are recycled.

4,490,540

(2-ARYL-4-PHENYLTHIOALKYL-1,3-DIOXOLAN-2-YLMETHYL)AZOLE DERIVATIVES

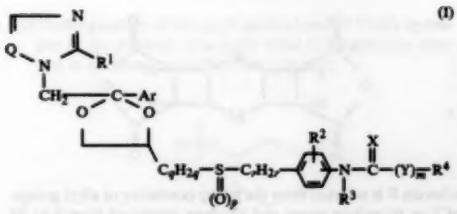
Jan Heeres, and Louis J. E. Van der Veken, both of Vosselaar, Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation of Ser. No. 301,672, Sep. 14, 1981, abandoned, which is a continuation-in-part of Ser. No. 209,790, Nov. 24, 1980, abandoned. This application Apr. 29, 1983, Ser. No. 487,600

Int. Cl.³ C07D *403/06*

U.S. Cl. 548—336 12 Claims

1. A chemical compound selected from the group consisting of



(I)

a pharmaceutically acceptable acid addition salt and a stereochemically isomeric form thereof, wherein

Q is a member selected from the group consisting of CH and N;

R^1 is a member selected from the group consisting of hydrogen and lower alkyl;

Ar is aryl;

p is 0 or the integer 1 or 2;

q is the integer 1, 2 or 3;

r is 0 or the integer 1 or 2;

R^2 is a member selected from the group consisting of hydrogen, lower alkyl, lower alkyloxy and halo;

R^3 is a member selected from the group consisting of hydrogen, lower alkyl and aryllower alkyl;

X is a member selected from the group consisting of O and S;

Y is a member selected from the group consisting of O, S and NR^5, wherein R^5 is a member selected from the group consisting of hydrogen and lower alkyl;

m is 0 or the integer 1; and

R^4 is a member selected from the group consisting of hydrogen, alkyl, mono-, di- and trihalolower alkyl, lower alkenyl, lower alkynyl, cycloalkyl, hydroxylower alkyl, lower alkoxy-lower alkyl, aryloxylower alkyl, aryllower alkyloxylower alkyl, mercaptolower alkyl, lower alkylthioether alkyl, arylthiolower alkyl, aryllower alkylthiolower alkyl, lower alkylcarbonyloxylower alkyl, arylcarbonyloxylower alkyl, aryllower alkylcarbonyloxylower alkyl, aryl, aryllower alkyl, lower alkyloxycarbonyllower alkyl, amino, and mono- and di(lower alkyl)amino; provided that Y is a radical NR^5 when m is 1 and R^4 is hydrogen, amino or amino-or di(lower alkyl)amino;

wherein aryl is a phenyl group which is optionally substituted with 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy and nitro; alkyl is a hydrocarbon of from one to ten carbon atoms; and cycloalkyl is cyclopropyl, cyclobutyl, cyclopentyl, or cyclohexyl.

4,490,541

5(3)-AMINOPYRAZOLO-3,4(4,5)-DICARBOXIMIDE AZO DYESTUFF INTERMEDIATES

Heinz Eilingsfeld, and Karl-Heinz Etzbach, both of Frankenthal, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

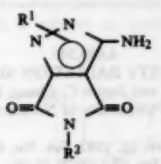
Filed Jan. 6, 1983, Ser. No. 456,095

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204713

Int. Cl.³ C07D *487/02*

U.S. Cl. 548—370 3 Claims

1. An aminopyrazole compound of the formula I



where R^1 is hydrogen, C_1–C_{12}-alkyl which may or may not be interrupted by oxygen or sulfur and can also be substituted by hydroxyl, C_1–C_4-alkoxy, phenyl, phenoxy, cyano or C_1–C_{12}-alkoxycarbonyl, or is cyclohexyl, C_1–C_{12}-alkanoyl, benzoyl which is unsubstituted or substituted by chlorine, cyano, or nitro, C_1–C_4-alkoxycarbonyl, phenoxycarbonyl, or sulfamyl or carbamyl which is unsubstituted or N-monosubstituted or N,N-disubstituted by C_1–C_4-alkyl or phenyl, thiocarbamyl, C_1–C_4-alkylsulfonyl, phenylsulfonyl or tolylsulfonyl, or is naphthyl or phenyl which is unsubstituted or substituted by fluorine, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkanoyl, nitro, benzoyl, cyano, C_1–C_4-alkoxysulfonyl, phenoxysulfonyl, hydroxysulfonyl, C_1–C_4-alkoxycarbonyl, phenoxycarbonyl, carboxyl or by sulfamyl or carbamyl which is unsubstituted or N-monosubstituted or N,N-disubstituted by C_1–C_4-alkyl or phenyl, and R^2 is hydrogen, C_1–C_{12}-alkyl which may or may not be interrupted by oxygen or sulfur and can also be substituted by hydroxyl, C_1–C_4-alkoxy, C_1–C_4-alkanoyloxy, benzoyloxy, phenyl, phenoxy, cyano, or C_1–C_{12}-alkoxycarbonyl, or is allyl, cyclohexyl, C_1–C_4-alkoxy-C_2–C_3-alkyl, hydroxy-C_2–C_3-alkyl, phenoxy-C_2–C_3-alkyl, benzyl, or phenylethyl, or is naphthyl or phenyl which is unsubstituted or substituted by fluorine, chlorine, bromine, C_1–C_4-alkyl,

C_1–C_4-alkoxy, nitro, cyano, C_1–C_4-alkoxysulfonyl, phenoxysulfonyl, hydroxysulfonyl, C_1–C_4-alkoxycarbonyl, phenoxycarbonyl, carboxyl or carbamyl.

4,490,542

1,4-DIKETO-PYRROLO[3,4-C]PYRROLES

Abul Iqbal, Ettingen, and Luigi Cassar, Kaiseraugst, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

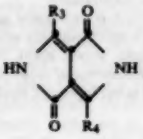
Division of Ser. No. 358,734, Mar. 16, 1982, Pat. No. 4,415,685. This application Aug. 1, 1983, Ser. No. 519,170

Claims priority, application Switzerland, Mar. 20, 1981, 1905/81

Int. Cl.³ C07D 487/08

U.S. Cl. 548—453 **4 Claims**

1. A compound of the formula



wherein R_3 and R_4 are the same and each is 1-naphthyl, 2-naphthyl, 4-chlorophenyl, 3-chlorophenyl, 4-methylphenyl, 4-cyanophenyl, 4-dimethylaminophenyl, 3-methylphenyl, 4-bromophenyl, 3-trifluoromethylphenyl, 4-benzoylaminophenyl, 4-tert-butylphenyl, 3,4-dimethylphenyl, 3-methoxycarbonylphenyl, 4-methoxycarbonylphenyl, 3,4-dimethoxyphenyl, 4-methylsulfonylphenyl, 3-chloro-4-methylphenyl, 4-methoxyphenyl, 4-acetoxyphenyl, 4-acetylaminophenyl, 3-cyanophenyl, 3-bromophenyl, 4-(p-butylbenzoyloxy)phenyl, 3,5-dichlorophenyl, 3,5-dimethoxyphenyl, 4-ethoxycarbonylphenyl, 4-fluorophenyl, 4-hydroxyphenyl or 3-hydroxyphenyl.

4,490,543

LOW TOXICITY RADIATION SENSITIZER

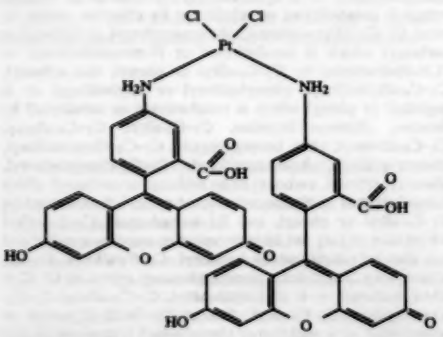
Barton L. Bergquist, and James C. Chang, both of Cedar Falls, Iowa, assignors to University of Northern Iowa Foundation, Cedar Falls, Iowa

Filed Nov. 12, 1982, Ser. No. 440,840

Int. Cl.³ C07F 15/00

U.S. Cl. 549—212 **1 Claim**

1. Bis(5-aminofluorescein)dichloroplatinum(II) of the formula:



4,490,544

MACROCYCLIC CARBONATES, PROCESSES FOR PREPARING SAME, ORGANOLEPTIC USES THEREOF AND INTERMEDIATES USED IN SAID PROCESS

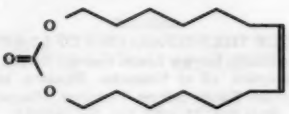
Wilhelmus J. Wiegers, Red Bank, N.J.; Augustinus G. Van Loveren, Rye, N.Y.; Marie R. Hanna, Hazlet, N.J.; Domenick Laccarelli, Jr., Neptune, N.J.; David R. Bowen, Red Bank, N.J., and Manfred H. Vock, Locust, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jul. 8, 1983, Ser. No. 511,909

Int. Cl.³ C07D 321/00

U.S. Cl. 549—228 **1 Claim**

1. The compound having the structure:



4,490,545

CYCLIC DIANHYDRIDES PREPARED FROM MALEIC ANHYDRIDE

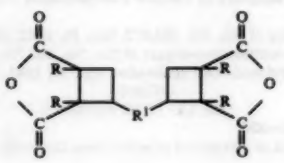
Mark L. Winzenburg, Naperville; Ellis K. Fields, River Forest, and Benjamin L. Shneider, Glen Ellyn, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 22, 1983, Ser. No. 524,937

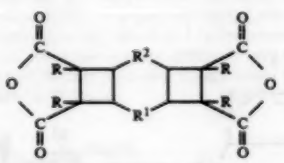
Int. Cl.³ C07D 307/93

U.S. Cl. 549—234 **19 Claims**

1. As a composition of matter a cycloaliphatic tetracarboxylic acid dianhydride of the structure selected from the group consisting of



and



wherein R is selected from the group consisting of alkyl groups of 1 to 10 carbon atoms and alkylene groups of from 2 to 20 carbon atoms linked together to form a ring, and R^1 and R^2 are individually selected from the group consisting of alkylene groups of from 1 to 10 carbon atoms and aralkylene groups of from 8 to 20 carbon atoms with the provision that hydrocarbon moieties of said groups can contain stable linkages selected from the groups consisting of —O—,

—SO—, $—SO_2—$, and —S— radicals.

4,490,546

PROCESS FOR 4A'(R),5'-DIHYDROMEVINOLIN

Chan-Hwa Kuo, South Plainfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 362,018, Mar. 25, 1982, abandoned. This application Jun. 20, 1983, Ser. No. 506,093

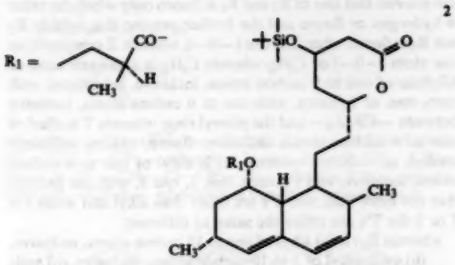
Int. Cl.³ C07D *309/30*

U.S. Cl. 549—292 **6 Claims**

1. A process for the preparation of trans 4a',5'-dihydromevinolin comprising the steps of:

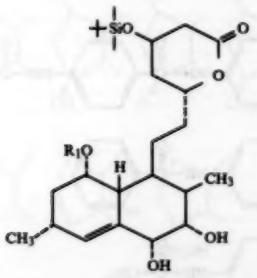
(a) t-butyldimethylsilylation of mevinolin with t-butyldimethylsilyl chloride and an acid acceptor at about 20°–50° C. for about 2 to 16 hours to produce 2;

2



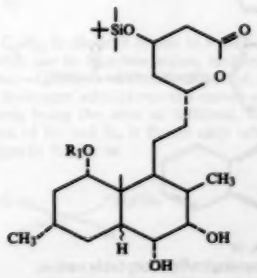
(b) osmium tetroxide hydroxylation of 2 to produce 3 by treating 2 with OsO_4 in a mixture of pyridine base and a benzenoid aromatic solvent;

3



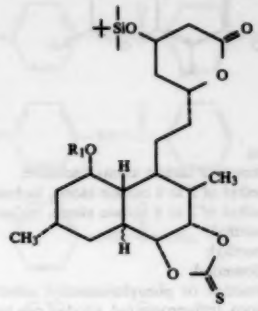
(c) hydrogenation of the 4a',5'-double bond of 3 with hydrogen in the presence of a noble metal hydrogenation catalyst in a solvent to produce the glycol 4;

4



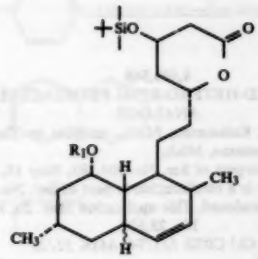
(d) cyclic thionocarbonate formation to give 5, by treatment of 4 with 1,1'-thiocarbonyldiimidazole in a benzenoid aromatic solvent at about 50°–100° C. for about 15 to 60 minutes;

5



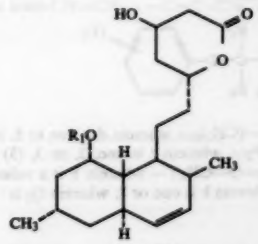
(e) conversion of the thionocarbonate 5 to the silylated olefin 6 by treatment of 5 with triethylphosphite at reflux temperature for about 100 to 200 hours;

6



(f) hydrolysis of the t-butyldimethylsilyl ether 6 with dilute mineral acid in a solvent to produce 4a'(R),5'-dihydromevinolin 7

7



4,490,547

ANTIATHEROSCLEROTIC BENZOPYRANS

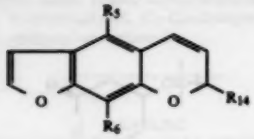
Ronald B. Gammill, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 378,700, May 17, 1982, Pat. No. 4,438,274. This application Oct. 27, 1983, Ser. No. 546,004

Int. Cl.³ C07D *311/78*

U.S. Cl. 549—387 **2 Claims**

1. A benzopyran of formula III



III

wherein

R_{14} is

(1) hydrogen;

(2) alkyl of one to 8 carbon atoms, inclusive;

(3) alkoxymethyl of 2 to 8 carbon atoms, inclusive;

(4) alkylthioalkyl of 2 to 8 carbon atoms, inclusive;

(5) trifluoromethyl;

(6) phenoxymethyl;

(7) phenylthiomethyl;

(8) phenoxymethyl or phenylthiomethyl substituted by chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms or alkoxy of one to 8 carbon atoms; or

(9) cycloalkyl of 3 to 10 carbon atoms, inclusive; and wherein one of R_5 and R_6 is methoxy and the other is hydrogen or R_5 and R_6 are both methoxy.

4,490,548

ENLARGED-HETERO-RING PROSTACYCLIN ANALOGS

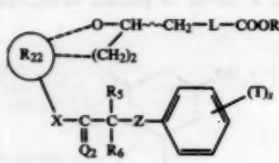
Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 904,781, May 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 788,143, Apr. 19, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 23,552

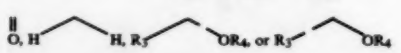
Int. Cl.[3] **C07D** *311/94;* **A61K** *31/35*

U.S. Cl. 544—396 **67 Claims**

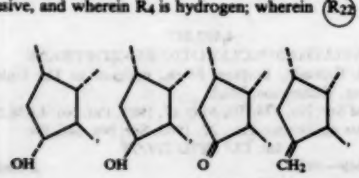
1. A cyclic ether of the formula



wherein L is (1) $-(CH_2)_d-$ wherein d is one to 5, inclusive, (2) $-(CH_2)_t-CF_2-$ wherein t is one, 2, or 3, (3) $-CH=CH-$, (4) $-CH_2-O-CH_2Y-$ wherein Y is a valance bond or $-(CH_2)_k-$ wherein k is one or 2; wherein Q_2 is



wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and wherein R_4 is hydrogen; wherein R_{22} is



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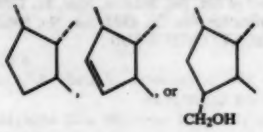
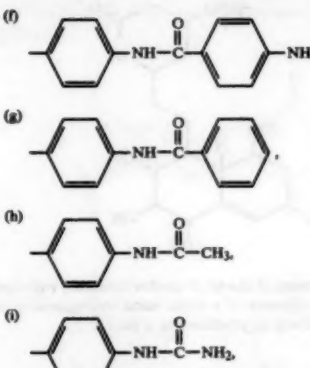


wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 6 carbon atoms, inclusive between $—CR_5R_6—$ and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_7—$ wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, one 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different;

wherein R_{27} is (a) alkyl of one to 12 carbon atoms, inclusive, (b) cycloalkyl of 3 to 10 carbon atoms, inclusive, (c) aralkyl of 7 to 12 carbon atoms, inclusive, (d) phenyl, (e) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive;



(1) hydrogen, or

(m) a pharmacologically acceptable cation;

wherein X is cis- or trans-CH=CH—, —C≡C—, or $—CH_2CH_2—$; wherein ~ indicates attachment in alpha or beta configuration; including the lower alkanoates thereof.

4,490,549

ENLARGED-HETERO-RING PROSTACYCLIN ANALOGS

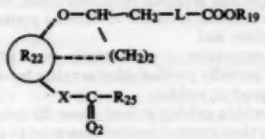
Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 904,781, May 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 788,143, Apr. 19, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 23,806

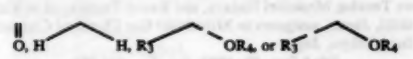
Int. Cl.³ C07D *311/94*; A61K *31/35*

U.S. Cl. 549—396 **67 Claims**

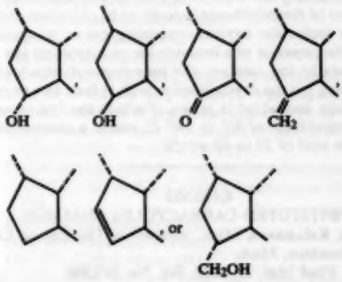
1. A cyclic ether of the formula



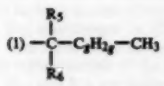
wherein L is (1) $-(CH_2)_d-$ wherein d is one to 5, inclusive, (2) $-(CH_2)_t-CF_2-$ wherein t is one, 2, or 3, (3) $-CH=CH-$ or (4) $-CH_2-O-CH_2-Y-$ wherein Y is a valence bond or $-(CH_2)_k-$ wherein k is one or 2; wherein Q_2 is



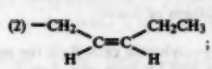
wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and wherein R_4 is hydrogen; wherein R_{22} is



wherein R_{25} is

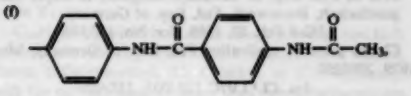


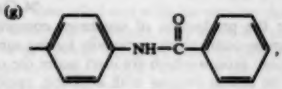
wherein C_sH_{2s} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro; or

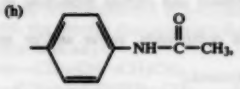


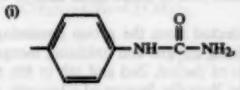
R_{19} is

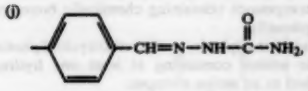
(a) alkyl of one to 12 carbon atoms, inclusive, (b) cycloalkyl of 3 to 10 carbon atoms, inclusive, (c) aralkyl of 7 to 12 carbon atoms, inclusive, (d) phenyl, (e) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,

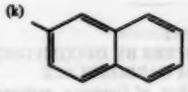
(f) 

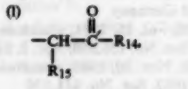
(g) 

(h) 

(i) 

(j) 

(k) 

(l) 

wherein R_{14} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{15} is hydrogen or benzoyl,

(m) hydrogen or

(n) a pharmacologically acceptable cation and wherein X is cis- or trans-CH=CH—, —C≡C—, or $-CH_2CH_2-$.

4,490,550

PREPARATION OF DIBENZOFURAN

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 15, 1983, Ser. No. 504,695

Int. Cl.³ C07D *307/91*

U.S. Cl. 549—460 **11 Claims**

1. A process for the production of dibenzofuran which comprises reacting diphenyl ether with oxygen in the presence of a carboxylic acid and a catalyst composed of a palladium carboxylate and a carboxylate of at least one member selected from the group consisting of antimony, tin, cobalt, lead, manganese, potassium, zinc and chromium.

4,490,551

PROCESS FOR THE PRODUCTION OF URETHANES

Hans-Joachim Scholl, Koeln, and Armin Zenner, Dormagen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Feb. 27, 1980, Ser. No. 125,008

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908250

Int. Cl.³ C07C *125/065, 125/073*

U.S. Cl. 560—025 24 Claims

1. A process for the production of urethanes comprising reacting aromatic amino compounds, optionally having substituents other than amino groups which are inert under the reaction conditions of the instant process with aliphatic, cycloaliphatic or araliphatic alcohols and carbon monoxide in the presence of

(a) selenium, selenium compounds, sulfur and/or sulfur compounds,

(b) aromatic nitro compounds,

(c) tertiary organic amines and/or alkali metal salts of weak acids,

(d) oxidizing agents selected from the group consisting of oxygen, gases containing oxygen and oxidizing inorganic compounds of metals of the 1st, 2nd and 5th to 8th Secondary Groups of the Periodic System of Elements, said inorganic compounds containing chemically bound oxygen and, optionally,

(e) ammonia and/or aliphatic, araliphatic, cycloaliphatic or heterocyclic amines containing at least one hydrogen atom attached to an amine nitrogen.

4,490,552

PREPARATION OF ARYL ESTERS BY DECOMPOSING AN ARYL THALLIUM CARBOXYLATE

Ulrich Knips, Plettenberg, Fed. Rep. of Germany, assignor to Rutgerswerke AG, Fed. Rep. of Germany

Continuation of Ser. No. 284,126, Jul. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 136,550, Apr. 2, 1980, abandoned, and Ser. No. 208,658, Nov. 20, 1980, abandoned.

This application Dec. 20, 1982, Ser. No. 451,176

Claims priority, application Fed. Rep. of Germany, May 9, 1979, 2918592; Dec. 11, 1979, 2949671

Int. Cl.³ C07C *67/00*

U.S. Cl. 560—130 15 Claims

1. A process for the preparation of an aryl ester of an organic carboxylic acid comprising decomposing a compound of the formula

wherein Ar is an aryl radical, X is an acyloxy of an organic carboxylic acid and Y is selected from the group consisting of an acyloxy of an organic carboxylic acid and an anion of a strong organic sulfonic and mineral acid in a neutral or acidic aqueous medium at 20° to 100° C. for 2 to 4 hours at atmospheric pressure in the presence of a soluble palladium salt in a molar ratio of palladium to thallium of 1:200 to 1:400 and in the absence of an iodide salt.

4,490,553

PROCESS FOR PRODUCTION OF ETHYL ACRYLATE

Joseph D. Chase, Robstown, and William W. Wilkison, Richardson, both of Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Aug. 29, 1980, Ser. No. 182,553

Int. Cl.³ C07C *67/04, 67/54*

U.S. Cl. 560—205 3 Claims

1. In a process for the production of ethyl acrylate comprising the steps of:

(a) reacting ethylene and acrylic acid in the presence of sulfuric acid to form a reaction product;

(b) separating said reaction product into crude ethyl acrylate and a sulfuric acid residue;

(c) recycling a major portion of said sulfuric acid residue of step (b) to step (a) and passing the remaining portion of said residue from step (b) through a wiped-film evaporator which is heated in its initial sections so that said sulfuric acid residue reaches a temperature in the range from about 300° F. to about 360° F., and cooled in its withdrawal section(s) to cool said sulfuric residue to a temperature in the range from about 230° F. to about 280° F., thereby removing spent sulfuric acid residue from the system;

(d) separating the light end materials from said crude ethyl acrylate and other reaction products to obtain a partially purified ethyl acrylate; and

(e) separating and recovering a substantially pure ethyl acrylate from said partially purified ethyl acrylate leaving an ethyl acrylate product residue;

the improvement comprising passing at least about 50 weight percent of said ethyl acrylate product residue of step (e) to said wiped-film evaporator of (c) and passing the remaining portion of said ethyl acrylate product residue to the separation step (b).

4,490,554

PROCESS FOR CRYSTALLIZING TRIMELLITIC ACID

Toru Tanaka; Masanori Hataya, and Kazuo Tanaka, all of Kurashiki, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 30, 1982, Ser. No. 454,595

Claims priority, application Japan, Jan. 23, 1982, 57-9334

Int. Cl.³ C07C *51/43*

U.S. Cl. 562—486 2 Claims

1. In crystallizing and separating trimellitic acid obtained by the oxidation of dimethylbenzaldehyde or its oxidation derivative with a molecular oxygen-containing gas in an aqueous solvent in the presence of a bromine ion or a bromine ion and a heavy metallic ion catalyst, the improvement which comprises carrying out the crystallization with at least two crystallization vessels connected in series, of which the first vessel is kept at a temperature of 40° to 130° C. and at a concentration of trimellitic acid of 20 to 60 wt. %.

4,490,555

9-SUBSTITUTED CARBACYCLIN ANALOGS

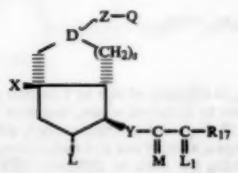
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 19, 1982, Ser. No. 360,090

Int. Cl.³ C07C *177/00, 57/26*

U.S. Cl. 562—501 12 Claims

1. A compound of the formula



wherein X is chloro, iodo, trifluoromethyl, or —COOH;

wherein D is cis—C=C(R$_3$)—, trans—C=C(R$_3$)— or >CHCH$_2$, wherein R$_3$ is hydrogen or fluoro;

wherein Z is:

(1) —CH$_2$—(CH$_2$)$_f$—C(R$_4$)$_2$— wherein each R$_4$ is the same and is hydrogen or fluoro, and f is zero, one, 2 or 3;

(2) trans—CH$_2$—CH=CH—; or

(3) —(Ph)—(CH$_2$)$_g$— wherein Ph is 1,2-, 1,3-, or 1,4-phenylene and g is zero, one, 2 or 3; with the proviso that when Z is —(Ph)—(CH$_2$)$_g$—, R$_3$ is hydrogen;

wherein Q is

(1) —$COOR_5$, wherein R_5 is

(a) hydrogen,

(b) (C_1–C_{12})alkyl,

(c) (C_3–C_{10})cycloalkyl,

(d) (C_7–C_{12})aralkyl,

(e) phenyl optionally substituted with one, 2 or 3 chloro or (C_1–C_4)alkyl,

(f) phenyl substituted in the para-position with —NH-COR_6, —COR_7, —OC(O)R_8 or —CH=N—NH-$CONH_2$, wherein R_6 is methyl, phenyl, acetamidophenyl, benzamidophenyl or —NH_2; R_7 is methyl, phenyl, —NH_2, or methoxy; and R_8 is phenyl or acetamidophenyl;

(g) phthalidyl,

(h) 3-(5,5-dimethyl-1,3,2-dioxaphosphorinan-2-yl)-2-oxopropan-1-yl P-oxide.

(i) 3-(5,5-di(hydroxymethyl)-1,3,2-dioxaphosphorinan-2-yl)-2-oxopropan-1-yl P-oxide, or

(j) a pharmacologically acceptable cation; with the proviso that when X is —COOH, Q is —$COOR_5$ wherein R_5 is (C_1-$_4$alkyl);

(2) —CH_2OH;

(3) —COL_2, wherein L_2 is

(a) an amino group of the formula —NR_9R_{10} wherein R_9 is hydrogen or (C_1–C_{12})alkyl and R_{10} is

(i) hydrogen

(ii) (C_1–C_{12})alkyl

(iii) (C_3–C_{10})cycloalkyl,

(iv) (C_7–C_{12})aralkyl

(v) phenyl optionally substituted with one, 2 or 3 chloro, (C_1–C_3)alkyl, hydroxy, carboxy, (C_2–C_5)alkoxycarbonyl, or nitro,

(vi) (C_2–C_5)carboxyalkyl,

(vii) (C_2–C_5)carbamoylalkyl,

(viii) (C_2–C_5)cyanoalkyl,

(ix) (C_3–C_6)acetylalkyl,

(x) (C_7–C_{12})benzoalkyl, optionally substituted by one, 2, or 3 chloro, (C_1–C_3)alkyl, hydroxy, (C_1–C_3)alkoxy, carboxy, (C_2–C_5)-alkoxycarbonyl, or nitro,

(xi) pyridyl, optionally substituted by one, 2, or 3 chloro (C_1–C_3)alkyl, or (C_1–C_3)alkoxy,

(xii) (C_6–C_9)pyridylalkyl optionally substituted by one, 2, or 3 chloro, (C_1–C_3)alkyl, hydroxy, or (C_1–C_3)alkyl,

(xiii) (C_1–C_4)hydroxyalkyl,

(xiv) (C_1–C_4)dihydroxyalkyl,

(xv) (C_1–C_4)trihydroxyalkyl;

(b) cycloamine selected from the group consisting of pyrolidino, piperidino, morpholino, piperazino, hexamethyleneimino, pyrroline, or 3,4-didehydropiperidinyl optionally substituted by one or 2 (C_1–C_{12})alkyl;

(c) carbonylamino of the formula —$NR_{11}COR_{10}$, wherein R_{11} is hydrogen or (C_1–C_4)alkyl and R_{10} is other than hydrogen, but otherwise defined as above;

(d) sulfonylamino of the formula —$NR_{11}SO_2R_{10}$, wherein R_{11} and R_{10} are defined in (c);

(4) —$CH_2NL_3L_4$, wherein L_3 and L_4 are hydrogen or (C_1–C_4)alkyl, being the same or different, or the pharmacologically acceptable acid addition salts thereof when Q is —$CH_2NL_3L_4$; or

(5) —CN;

wherein s is the integer one or 2;

wherein L is H,H; α-OR_{12},β-H; α-H,β-OR_{12}; α-CH_2OR_{12},β-H; α-H,β-CH_2OR_{12}

wherein R_{12} is hydrogen or a hydroxyl protective group with the proviso that when X is —COOH, R_{12} is other than hydrogen;

wherein Y is trans —CH=CH—, cis—CH=CH—, —CH_2CH_2—, or —C≡C—;

wherein M is α-OR_{12},β-R_{14}; or α-R_{14},β-OR_{12}, wherein R_{12} is as defined above, and R_{14} is hydrogen or methyl;

wherein L_1 is α-R_{15},β-R_{16}; α-R_{16},β-R_{15}; or a mixture thereof wherein R_{15} and R_{16} are hydrogen, methyl, or fluoro being the same or different with the proviso that one of R_{15} and R_{16} is fluoro only when the other of R_{15} and R_{16} is hydrogen or fluoro;

wherein R_{17} is

(1) —$C_mH_{2m}CH_3$ wherein M is an integer of from one to 5,

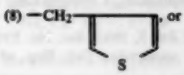
(2) phenoxy optionally substituted by one, 2, or 3 chloro, fluoro, trifluoromethyl, (C_1–C_3)alkyl, or (C_1–C_3)alkoxy, with the proviso that not more than two substituents are other than alkyl and with the proviso that R_{17} is phenoxy or substituted phenoxy, only when R_{15} and R_{16} are hydrogen or methyl, being the same or different;

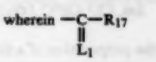
(3) phenyl, benzyl, phenylethyl, or phenylpropyl optionally substituted on the aromatic ring by one, 2, or 3 chloro, fluoro, trifluoromethyl (C_1–C_3)alkyl, or (C_1–C_3)alkoxy, with the proviso that not more than two substituents are other than alkyl,

(4) cis—CH=CH—CH_2CH_3,

(5) —$(CH_2)_2$—CH(OH)—CH_3,

(6) —$(CH_2)_3$—CH=$C(CH_3)_2$,

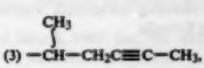




taken together is

(1) (C_4–C_7)cycloalkyl optionally substituted by one to 3 (C_1–C_5)-alkyl,

(2) 3-thienyloxymethyl,



(4) —C≡C—$C_qH_{2q}CH_3$ wherein q is an integer of from 2 to 6, or

(5) —C_pH_{2p}CH=CH_2 wherein p is an integer of from 3 to 7; and individual optical isomers thereof.

4,490,556

METHOD FOR PREPARING BIS[β-(N,N-DIMETHYLAMINO)ETHYL]ETHER

Sadakatsu Kumoi, Hikari; Hideo Sakka, Shinnanyo, and Yukihiro Tsutsumi, Tokuyama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Oct. 18, 1983, Ser. No. 542,949

Claims priority, application Japan, Oct. 18, 1982, 57-181407

Int. Cl.[3] *C07C 85/00, 85/24*

U.S. Cl. 564—508 **7 Claims**

1. A method for preparing bis[β-(N,N-dimethylamino)ethyl]ether which consists of introducing vapor of sulfuric anhydride into a mixed solution consisting of sodium N,N-dimethylaminoethoxide, N,N-dimethylethanolamine and dioxane to undergo a one stage reaction at a temperature not exceeding 100° C.

4,490,557

ETHYLIDENE BISFORMAMIDE, ITS PREPARATION AND USE IN PREPARING POLY(VINYLAMINE) AND SALTS THEREOF

Daniel J. Dawson, Los Altos, and Kenneth M. Otteson, Redwood City, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Nov. 5, 1981, Ser. No. 318,615
Int. Cl.³ C07C *102/00*
U.S. Cl. 564—159 7 Claims

1. A process for preparing ethylidene bisformamide which comprises contacting a liquid admixture comprising formamide, acetaldehyde, and an ammonia scavenger with a catalytic amount of an acidic catalyst at a temperature greater than 50° C. and under conditions sufficient to thereby form an ethylidene bisformamide reaction product, separating said reaction product from the catalyst and recovering from it ethylidene bisformamide using a low residence time-high surface area evaporator.

4,490,558

PREPARATION OF THIOETHERS

Kaspar Bott, Wachenheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 5, 1983, Ser. No. 510,934
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1982, 3225709
Int. Cl.³ C07C *149/30*
U.S. Cl. 568—58 7 Claims

1. A process for the preparation of a thioether of the formula

$$R^1—S—R^2 \quad I$$

where R^1 and R^2 are identical or different and are each an aliphatic, cycloaliphatic or araliphatic radical, and R^1 may furthermore be an aromatic radical, by reacting a mercaptan with an oxygen-containing compound, wherein an alkali metal mercaptide of the formula

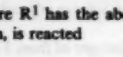
$$R^1—S—M \quad II$$

where R^1 has the above meanings and M is an alkali metal atom, is reacted

(a) with an alcohol of the formula

$$R^2—OH \quad III$$

where R^2 has the above meanings, and carbon monoxide, or (b) with a formate of the formula



IV

where R^2 has the above meanings.

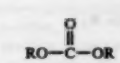
4,490,559

PROCESS FOR MAKING ALDEHYDES FROM DIESTERS OF CARBONIC ACID

Richard W. Wegman, S. Charleston, and John B. Letts, Dunbar, both of W. Va., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 27, 1984, Ser. No. 593,961
Int. Cl.³ C07C *45/49, 45/41*
U.S. Cl. 568—484 10 Claims

1. Method of preparing saturated aliphatic aldehydes which comprises contacting a diester of carbonic acid having the formula:



wherein each R is a monovalent radical selected from the class consisting of alkyl having from 1 to 15 carbons, aryl radicals having 6 to about 10 ring carbon and cycloalkyl radicals having 5 to about 7 ring carbons with a catalytic amount of a Group VIII compound and a halogen promoter at a temperature of about 80° to 220° C. and a pressure of about 200 to about 6000 psig in the presence of a mixture of carbon monoxide and hydrogen.

4,490,560

DECOLORIZING POLYMERS OF EPIHALOHYDRIN

Simon H. Yu, North Ridgeville, and Daniel A. Versace, Lorain, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 29, 1982, Ser. No. 427,324
Int. Cl.³ C07C *41/36*
U.S. Cl. 568—614 10 Claims

1. A method comprising passing a liquid polymer of an epihalohydrin that is of a yellow to dark brown color through a column of amorphous silica in order to essentially remove the color, said polymer haing molecular weight (Mn) in the range of about 250 to 50,000.

4,490,561

METHOD FOR ALKOXYLATING FLUORINATED ALCOHOLS

Kang Yang; Charles M. Starks, and O. Carl Kerfoot, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Oct. 13, 1983, Ser. No. 541,811
Int. Cl.³ C07C *41/03*
U.S. Cl. 568—615 6 Claims

1. In a method for the alkoxylation of fluorinated alcohols by contacting said alcohols with an alkoxylating agent in the presence of a catalyst, at temperatures of from about 90° C. to about 260° C., the improvement comprising using as a catalyst at least one material having a general formula selected from the group consisting of

(1) $(R)_{q-v}MX_v$
(2) $HF/M(OC_nR^1{}_{2n+1})_q$
(3) $BF_3/M(R)_q$ and
(4) $SiF_4/M(R)_q$

wherein M is a metal selected from the group consisting of gallium, indium, thallium, zirconium, hafnium, aluminum and titanium, v is from 1 to q−1, n is from 1 to 22, q is equal to the valence of M, and R is, independently, hydrogen, fluorine, alkyl groups containing from 1 to 20 carbon atoms, alkoxide groups containing from 1 to 20 carbon atoms, R^1 is, independently, hydrogen or fluorine, and X is halogen.

4,490,562

PROCESS FOR THE PREPARATION OF A VERY PURE COMMERCIAL FORM OF 4,2',4'-TRICHLORO-2-HYDROXYDIPHENYL ETHER

Werner Schreiber, Basel, and Michael Märky, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,258
Claims priority, application Switzerland, Feb. 11, 1982, 853/82
Int. Cl.³ C07C *41/38, 41/40, 41/42*
U.S. Cl. 568—637 25 Claims

1. In a process for the preparation of 4,2',4'-trichloro-2-hydroxydiphenyl ether by diazotizing 4,2',4'-trichloro-2-amino-diphenyl ether and boiling the diazonium salt to produce the product contaminated with 2,4,8-trichlorodibenzofu-

ran, isolating the contaminated product and purifying the product, the improvement which comprises the steps of

(1) separating the reaction mixture at the end of the reaction into its organic and aqueous phases,

(2) adjusting the pH of the organic phase to pH 11 or more with aqueous alkali to give an aqueous solution of the product,

(3) extracting the alkaline aqueous solution with an inert, water-immiscible, organic liquid which is a solvent for 2,4,8-trichlorodibenzofuran,

(4) discarding the organic liquid extract,

(5) adjusting the pH of the alkaline aqueous solution following step 3 by addition of aqueous acid to give a pH in the range of 3 to 10 to cause separation of the product,

(6) subsequently subjecting the product to molecular distillation, and

(7) introducing the distillate from step 6 into an aqueous dispersion of pure crystalline product while wet grinding said dispersion to give the pure product in granular form.

4,490,563

ETHER RECOVERY

Joe Van Pool, and Paul D. Hann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 297,456, Aug. 28, 1981, abandoned. This application Feb. 8, 1983, Ser. No. 464,819

Int. Cl.³ C07C *41/58*

U.S. Cl. 568—697 **4 Claims**

1. A process for recovering MTBE from a reaction effluent containing MTBE, methanol, unreacted hydrocarbons comprising isobutylene and other C_4 hydrocarbons, and water which comprises

(a) fractionating said effluent under conditions which separate an overhead stream comprising unreacted hydrocarbons, methanol and water and a bottoms fraction comprising MTBE substantially free of methanol,

(b) passing said overhead in (a) directly to a condensation zone and subjecting same to condensing and then phase separating said condensed overhead into an upper hydrocarbon phase also containing some methanol and water and a lower liquid phase comprising methanol and water,

(c) passing said separated upper hydrocarbon phase to a water wash zone and therein contacting same with water under conditions to recover a hydrocarbon stream substantially freed of methanol and water and a water stream containing methanol;

(d) passing said water stream in (c) and said lower liquid phase in (b) to a second fractionation zone operated under conditions to separately recover a methanol stream and a water stream;

(e) passing said hydrocarbon stream in (c) through a drying zone and then to an alkylation zone for contact with an olefin and an alkylation catalyst to form alkylate, and

(f) using at least a portion of the effluent from the drying zone in (e) to regenerate another drier on regeneration cycle and separating the condensate formed into a hydrocarbon phase which is passed to a drier on drying cycle and a water phase containing methanol which is passed as part of the feed for said second fractionation zone in (d).

4,490,564

MIXED SOLVENT RECOVERY OF 4,4'-DIHYDROXYBIPHENYL

John J. Pendery, Huntington Woods, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 22, 1983, Ser. No. 487,856

Int. Cl.³ C07C *37/02, 39/12*

U.S. Cl. 568—730 **8 Claims**

1. A process for the preparation of 4,4'-dihydroxybiphenyl having high purity, said process comprising:

(a) hydrolyzing 4,4'-dibromobiphenyl in the presence of a copper compound hydrolysis catalyst in an alkaline aqueous solution and at a temperature of from room temperature to about 300° C.;

(b) separating said catalyst from said alkaline aqueous solution;

(c) acidifying said alkaline aqueous solution with an acid, forming crude solid 4,4'-dihydroxybiphenyl;

(d) separating said 4,4'-dihydroxybiphenyl;

(e) dissolving said 4,4'-dihydroxybiphenyl in an inert organic solvent;

(f) adding water to said inert organic solvent which allows the inorganic salt that may be present to remain in solution and said 4,4'-dihydroxybiphenyl begins to precipitate out of solution; and

(g) recovering said precipitated solid 4,4'-dihydroxybiphenyl.

4,490,565

PRODUCTION OF PHENOL

Clarence D. Chang, Princeton, and Bruce P. Pelrine, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 6, 1983, Ser. No. 492,093

Int. Cl.³ C07C *37/08*

U.S. Cl. 568—798 **5 Claims**

1. A process for the production of phenol and acetone which comprises contacting cumene hydroperoxide with a catalyst comprising zeolite beta.

4,490,566

PRODUCTION OF PHENOL

Clarence D. Chang, Princeton, and Bruce P. Pelrine, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 6, 1983, Ser. No. 492,104

Int. Cl.³ C07C *37/08*

U.S. Cl. 568—798 **7 Claims**

1. A process for the production of phenol and acetone which comprises contacting cumene hydroperoxide with a catalyst comprising a crystalline zeolite having a Constraint Index of 1 to 12 and a silica:alumina ratio of at least 12:1.

4,490,567

CATALYST AND PROCESS FOR DEHYDRATING 2-ALCOHOLS

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 8, 1982, Ser. No. 366,513

Int. Cl.³ C07C *1/00*

U.S. Cl. 585—324 **35 Claims**

1. A process for preparing an α-olefin comprising contacting a dehydratable 2-alcohol under suitable reaction conditions with a catalyst selected from the group consisting of catalysts comprising a catalytically effective amount of at least one catalytic metal selected from the group consisting of metals having atomic numbers of 21, 39, 58–71, or 90 supported on a support consisting essentially of an oxide of aluminum having a surface area no greater than 20 m^2/g.

24. A process for preparing an α-olefin comprising contacting a dehydratable 2-alcohol under suitable reaction conditions with a catalyst comprising base treated aluminum oxide having deposited thereon a catalytically effective amount of a mixture of thorium oxide and cerium oxide.

4,490,568

CONVERSION OF CERTAIN HYDROCARBONS USING CALCINED TEA-SILICATE CATALYST

Daniel C. Garska, St. Albans, W. Va., and Edith M. Flanigen, White Plains, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 373,729, Apr. 30, 1982, abandoned. This application Oct. 3, 1983, Ser. No. 538,288

Int. Cl.³ C07C 3/10

U.S. Cl. 585—415 10 Claims

1. A low severity process for the preparation of a benzene-toluene-xylenes enriched stream containing minimal monoolefin and diolefin content, from a feed stream comprising a by-product effluent of a process for the pyrolitic cracking of hydrocarbons to produce light olefins or diolefins, said by-product effluent stream containing olefins and diolefins, said process comprising contacting said by-product effluent stream, under low severity conditions including a temperature within the range of about 300°–700° C., a pressure within the range of about 0 to 100 atmospheres, and a weight hourly space velocity within the range of about 0.1 to about 20, with a catalyst essentially comprising a calcined TEA-silicate.

4,490,569

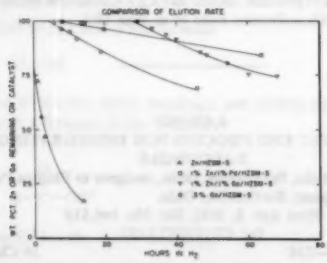
PROCESS FOR CONVERTING PROPANE TO AROMATICS OVER ZINC-GALLIUM ZEOLITE

Yung F. Chu, and Arthur W. Chester, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 417,822, Sep. 13, 1982, abandoned, which is a division of Ser. No. 262,280, May 11, 1981, Pat. No. 4,392,989. This application Dec. 2, 1983, Ser. No. 557,697

Int. Cl.³ C07C 3/10, 3/20

U.S. Cl. 585—415 17 Claims



1. A process for producing aromatic hydrocarbons which comprises contacting under conversion conditions, a gaseous hydrocarbon feedstream of C_2 to C_{12} hydrocarbons containing a high content of propane, with a catalyst consisting essentially of zinc and gallium and a crystalline zeolite characterized by a constraint index within the approximate range of 1 to 12 and a silica to alumina ratio of at least 12, the weight of gallium in said catalyst being between about 0.01 and about 2 percent based on the total weight of catalyst whereby propane present in said gaseous feed is converted to aromatic compounds, and recovering said aromatic compounds as liquids.

4,490,570

METHOD FOR PARA SELECTIVE ALKYLATION EMPLOYING SILICALITE CATALYSTS

Cleve H. Forward; James R. Butler; James M. Watson, and Gary D. Branum, all of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Feb. 22, 1982, Ser. No. 350,672

Int. Cl.³ C07C 2/68

U.S. Cl. 585—467 6 Claims

1. A process for the selective alkylation of a monoalkyl benzene in which the alkyl substituent is either methyl or ethyl, to yield a dialkyl benzene product in which the para isomer of the disubstituted product is present in a concentration greater than in a thermodynamic equilibrium, comprising:

passing the monoalkyl benzene and an alkylating agent capable of methylation or ethylation under conversion conditions which do not include steam cofeed through a reaction zone containing an unmodified crystalline silica polymorph silicalite catalyst.

4,490,571

OLIGOMERIZATION OF OLEFINS

Mark J. O'Hara, and Tamotsu Imai, both of Mount Prospect, Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 5, 1983, Ser. No. 539,208

Int. Cl.³ C07C 2/02

U.S. Cl. 585—525 19 Claims

1. In a process for the oligomerization of an olefin which contains from 2 to about 6 carbon atoms which comprises oligomerizing said olefin at oligomerization conditions in the presence of a catalyst comprising boron fluoride composited on an inorganic oxide, and recovering the resultant oligomer, the improvement which comprises treating said catalyst with an organic compound selected from the group consisting of ethers and amines.

4,490,572

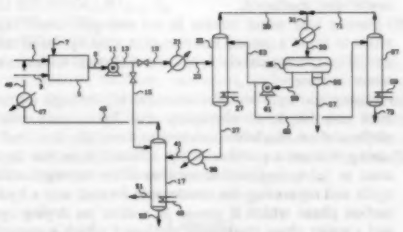
REMOVAL OF ORGANIC FLUORIDES FROM HF ALKYLATION PRODUCTS

Joe Van Pool, and Paul D. Hann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 30, 1983, Ser. No. 567,036

Int. Cl.³ C07C 7/00, 2/56

U.S. Cl. 585—800 6 Claims



1. A method for removing organic fluorides from HF catalyzed alkylation propane comprising:

(a) intimately contacting

(1) a stream of liquid HF obtained by settling liquid HF from the overhead accumulator common for both a depropanizing column and a hydrogen fluoride stripping column, with

(2) a liquid hydrocarbon stream containing organic fluorides derived from the condensing mixed vapor overhead from a depropanizing column and from a hydrogen fluoride stripping column in the process of separating products from a hydrogen fluoride alkylation, and

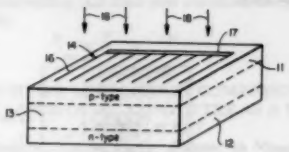
(b) passing the liquid admixture stream obtained from said contacting into said accumulator.

4,490,573

SOLAR CELLS

James F. Gibbons, Palo Alto, Calif., assignor to Sera Solar Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 107,437, Dec. 26, 1979, Pat. No. 4,270,018. This application May 20, 1981, Ser. No. 265,430
The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.
Int. Cl.³ H01L 31/06
U.S. Cl. 136—255 14 Claims



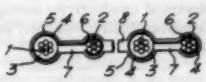
1. A solar cell comprising layers of n-type and p-type crystalline or substantially crystalline semiconductor material separated by a layer of amorphous semiconductor material having a larger coefficient of absorption than the outer p-type and n-type layers.

4,490,574

ELECTRICAL CABLE

Akira Tomita, Yamato, and Kunitada Tominoi, Kawasaki, both of Japan, assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 383,638, Jun. 1, 1982, abandoned. This application Dec. 13, 1983, Ser. No. 561,129
Claims priority, application United Kingdom, Jun. 18, 1981, 8118727
Int. Cl.³ H01B 7/08, 11/18
U.S. Cl. 174—36 8 Claims



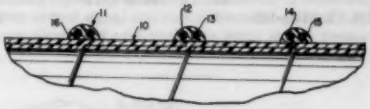
1. A shielded electrical cable, comprising:
a plurality of signal conductors;
a sheath of insulating material surrounding each of the signal conductors defining insulated signal conductors;
a plurality of ground conductors, the insulated signal conductors and the ground conductors being alternately arranged in spaced parallel relationship as a planar array;
a layer of shielding material substantially surrounding and electrically engaging each of the ground conductors and defining shield-engaging ground conductors, said layer of shielding material extending to an adjacent one of the insulated signal conductors and substantially surrounding the adjacent one of the insulated signal conductors; and
an outer layer of insulating material surrounding each of the shielded insulated signal conductors, each of the shield-engaging ground conductors, and the shielding material extending between adjacent signal conductors and ground conductors, the insulating material covering both sides of the layer of shielding material extending between adjacent signal conductors and ground conductors and defining a web.

4,490,575

FLEXIBLE HOSE WITH EXTERNAL SHEATHED ELECTRICAL CONDUCTOR

Thomas A. Kutnyak, Greenwood, Conn., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed May 26, 1983, Ser. No. 498,419
Int. Cl.³ A47L 9/24; F16L 11/12
U.S. Cl. 174—47 5 Claims



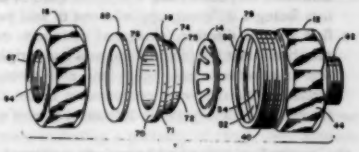
1. A helically fabricated electrically conductive flexible hose comprising
(a) at least one plastic strip wrapped helically with successive convolutions overlapping and forming a flexible hose wall of at least one ply, and
(b) at least one self-supporting electrically conductive helical reinforcing element forming the outermost element of the hose concentric with and engaging the outside of said wall and comprising
i. at least two spaced inner metal wires, and
ii. an outer plastic sheath of non-circular cross-section enclosing said wires and having a substantially flat side facing inwardly and engaging the outer ply of said wall,
iii. the plastic sheath being bonded to the plastic wall.

4,490,576

CONNECTOR FOR USE WITH JACKETED METAL CLAD CABLE

Jay J. Bolante, Chicago, and Herbert W. Penzel, Lincolnwood, both of Ill., assignors to Appleton Electric Co., Chicago, Ill.

Filed Aug. 10, 1981, Ser. No. 291,444
Int. Cl.³ H02G 3/22
U.S. Cl. 174—65 SS 4 Claims

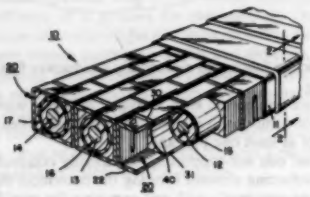


1. In a connector assembly for connecting metal clad cable to an electrical box, the connector assembly including a generally tubular body defining an outer end, an inner end, a larger and smaller inner diameter, and also including a stamped retaining element having an annular rim portion, the improvement comprising:
said retaining element having an outer diameter stamped to very nearly the same dimension as the larger inner diameter and having a plurality of narrow and relatively widely spaced fingers extending radially inwardly from said annular rim portion and numbering at least five, each finger being several times longer than its width, said fingers being canted away from the outer end of the assembly and cumulatively terminating radially inwardly in interfering relationship relative to the diameter of said metal clad cable whereupon said metal clad cable will significantly deflect said fingers when pushed therethrough inwardly but the radially innermost portions of said fingers dig into the cable so that it cannot be withdrawn thereafter, said tubular body having one internal diameter very nearly the same dimension as the outer diameter of said retaining element, and a shoulder adjacent said diameter for locating said retainer ring at a specific longitudinal position within the tubular body after it is assembled therein.

4,490,577
ELECTRICAL CABLE FOR USE IN EXTREME ENVIRONMENTS

David H. Neuroth, Bethany, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Apr. 14, 1983, Ser. No. 484,977
The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.
Int. Cl.³ H01B 7/18
U.S. Cl. 174—103 18 Claims



1. An electrical cable structure having substantially flat, opposite sides and opposite edges, comprising:

a plurality of elongated, individually insulated electrical conductors of circular cross-section, each of said conductors having a concentric layer of insulation thereon and a longitudinal axis, the longitudinal axes being in substantially parallel relationship to one another, the outermost ones of said conductors located inwardly adjacent a different one of the two edges and having their longitudinal axes contained in one plane with a longitudinal section of insulation on each of said outermost ones of said conductors facing a different, opposite one of said two edges;

a first pair of discrete, elongated members, each of said members having a longitudinal axis and a rigid cross-section transverse to said one plane and having a greater resistance to transverse compressive forces than that of the insulation layers on the outermost ones of said conductors;

the longitudinal axes of said members contained in a second plane which is substantially parallel to said one plane;

each of said members being flexible for long-radius bending along the longitudinal axis thereof in directions substantially perpendicular to said second plane; and

a protective jacket around the insulated conductors and said members;

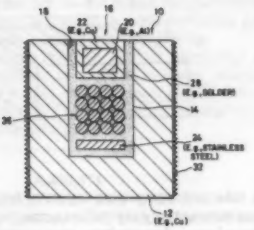
each of said members having a longitudinal portion thereof extending substantially parallel to and adjacent each said longitudinal section of insulation on an outermost one of said conductors, each of the member portions having an inner surface which is arcuate in its transverse cross-section for surrounding a longitudinal section of insulation, thereby restraining decompressive expansion of such insulation section;

each of said member portions having a substantially planar outer surface extending substantially perpendicular to said one plane between the sides of the structure at least coextensively with the longitudinal section of insulation on the conductor adjacent thereto, each of said outer surfaces of said member portions positioned in the structure intermediate an outermost one of said conductors and each adjacent edge of the structure for protecting the longitudinal sections of insulation on the outermost conductors from edge impacts.

4,490,578
INTEGRATED SUPERCONDUCTOR

Shobei Suzuki, Takahagi; Yoshiaki Kazawa; Ryusei Saito, both of Hitachi; Koji Noguchi, Tsuchiura; Hidezumi Morisi, Tsuchiura; Ryoichi Mashiko, Tsuchiura, and Shuji Sakai, Tsuchiura, all of Japan, assignors to Hitachi Cable, Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed Jul. 7, 1983, Ser. No. 511,481
Claims priority, application Japan, Jul. 9, 1982, 57-118388
Int. Cl.³ H01B 12/00
U.S. Cl. 174—15 S 20 Claims



1. An integrated superconductor comprising:

(1) a housing means, including a slot means for accommodating at least one monolithic superconductive member, said slot means forming an opening in said housing means;

(2) at least one monolithic superconductive member accommodated in said slot means;

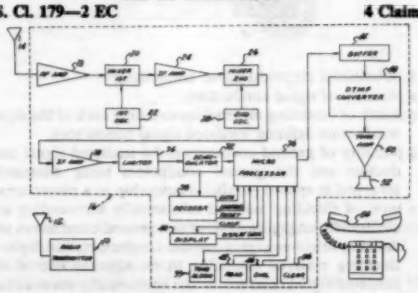
(3) a cover means inserted into said opening in the housing means, said cover means including a highly pure aluminum portion having an outer surface thereof covered with a highly pure copper portion; and

(4) means for bonding and integrating said at least one monolithic superconductive member, said housing means, and said cover means, said means for bonding and integrating providing electrical conductivity among the at least one monolithic superconductive member, said housing means and said cover means.

4,490,579
AUTO-DIALING PAGER RECEIVER

Vanig Godoshian, 2500 Pontiac Dr., Pontiac, Mich. 48053

Filed Apr. 15, 1983, Ser. No. 485,272
Int. Cl.³ H04M 11/00
U.S. Cl. 179—2 EC 4 Claims



1. A dialing pager consisting of a portable radio receiver comprising means for receiving, amplifying and demodulating radio wave signals, said radio wave signals comprising address information data and telephone number information data, means for decoding said address information data, memory means for storing said telephone number information data upon recognition by said decoding means of predetermined

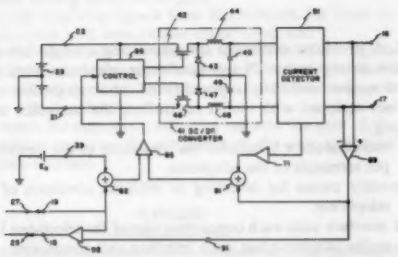
address information data, means for providing an alert signal, means for simultaneously displaying for a predetermined period of time said telephone number information data in the form of the telephone number of a caller, means for controllably recalling and displaying said telephone number information data stored in said memory means, buffer storage means for storing said recalled and displayed telephone number information data, means for controllably converting said telephone number information data stored in said buffer storage means to a series of dual tone multifrequency signals, and transducer means for converting said dual tone multifrequency signals to audio signals.

4,490,580

SUBSCRIBER LINE CIRCUIT COMPRISING A CONTROLLABLE DC/DC CONVERTER AS A BATTERY FEED CIRCUIT

Kunio Nagashima, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1982, Ser. No. 418,658
Claims priority, application Japan, Sep. 28, 1981, 56-153258
Int. Cl.³ H04B 3/36
U.S. Cl. 179—18 FA 4 Claims



1. A subscriber line circuit for delivering a loop signal of a variable voltage and a variable current to a subscriber substation through a two-wire line in response to a DC power and for supplying an exchange input signal to an input terminal of an exchange when said loop signal comprises a first communication signal delivered from said subscriber substation in a communication frequency band which is higher than a lower frequency band, said subscriber line circuit being responsive to an exchange output signal supplied from an output terminal of said exchange for making said loop signal comprise a second communication signal of said communication frequency band when said exchange output signal is in said communication frequency band, said subscriber line circuit being for connection to a reference voltage source and comprising:

a controllable DC to DC converter circuit responsive to said DC power for producing a converter output signal;

first signal producing means responsive to said loop signal for producing a first output signal representative of said variable current;

second signal producing means responsive to said loop signal for producing a second output signal representative of said variable voltage;

processing means having first and second transfer functions in said lower and said communication frequency bands, respectively, for processing a predetermined one of said first and said second output signals with said first and said second transfer functions to produce a processed signal;

first adding means for adding said processed signal to the other of said first and said second output signals to produce a first sum signal;

second adding means for adding said reference voltage to said exchange output signal to produce a second sum signal;

a blocking capacitor responsive to said second output signal for producing a capacitor output signal;

difference calculating means for calculating a difference between said exchange output signal and said capacitor output signal to produce a difference signal; and

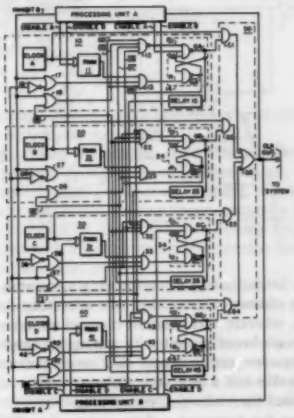
controlling means responsive to said first and said second sum signals for controlling said DC to DC converter circuit so as to render said first and said second sum signals substantially equal to each other and thereby to make said converter output signal and said difference signal provide said loop signal and said exchange input signal, respectively.

4,490,581

CLOCK SELECTION CONTROL CIRCUIT

Ivan L. Edwards, Downers Grove; Max S. Macrander, Warrenville, and Ashfaq R. Khan, Glendale Heights, all of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Sep. 30, 1982, Ser. No. 431,900
Int. Cl.³ G06F 1/04; H04Q 3/54
U.S. Cl. 179—18 EE 9 Claims



1. A clock selection control circuit for use in a telephone switching system including a plurality of clock circuits, each operative to provide a clock signal, and first and second processing units, each operative to provide first and second inhibit signals, respectively, said clock selection control circuit comprising:

first and second arrangements of one or more clock selection means each including first, second and third outputs, each clock selection means connected to an associated one of said clock circuits, to said third output of all other clock selection means and to said second output of an associated one of said clock selection means, each operative to provide signals on said first, second and third outputs, each operative in response to a clock signal from an associated clock circuit, said third output signal from all other selection means and said second output signal from said associated clock selection means, to provide said first output signal, each of said clock selection means further operative in response to said first output signal and a delay period to provide said second output signal, each of said clock selection means further operative in response to an absence of said clock signal from said associated clock circuit to provide said third output signal; each of said clock selection means further operative in response to an absence of said third output signal from said associated clock selection means to provide said third output signal;

each of said first arrangement of clock selection means further operative in response to said first inhibit signal to

simulate said third output signal from said associated clock selection means;

each of said second arrangement of clock selection means further operative in response to said second inhibit signal to simulate said third output signal from said associated clock selection means; and

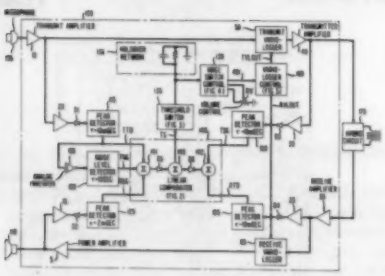
output gating means connected to all of said clock selection means and to said plurality of clock circuits, operative in response to each of said first output signals and a clock signal from an associated clock circuit to provide a clock out signal.

4,490,582

SPEAKERPHONE CONTROL CIRCUIT

Verne E. Munson, Brielle, N.J., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed Feb. 18, 1983, Ser. No. 467,783
Int. Cl.³ H04M *9/08, 1/60*
U.S. Cl. 179—81 B **14 Claims**



8. A loudspeaking circuit having a transmit channel and a receive channel connectable to a telephone line via a hybrid circuit, wherein said transmit channel includes a microphone and a variolosser circuit with a transmit amplifier interposed therebetween and wherein said receive channel includes a loudspeaker and a receive variolosser with a receive amplifier interposed therebetween, comprising

means for summing a first group of particular signals of different polarities derived from said transmit and receive channels and for providing a first signal equal to said summation only when said summation results in a first polarity,

means for summing a second group of particular signals of different polarities derived from said transmit and receive channels and providing a second signal equal to said second summation only when said second summation results in a second polarity,

means for providing a difference signal whose polarity and magnitude is established by the difference between said first and second signals,

means for comparing the magnitude of said difference signal against a threshold and for providing a threshold signal when said difference signal exceeds said threshold, and wherein the magnitude of said threshold signal is controllable by the polarity of said difference signal,

means for exclusively providing either a first control signal responsive to a first threshold signal magnitude or a second control signal responsive to a second threshold signal magnitude, and

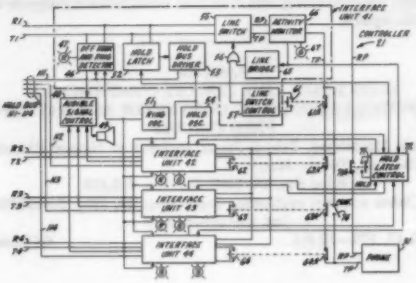
means for generating complementary loss control signals for controlling the loss level of said transmit and receive variolossers, respectively, wherein said loss control signals have a first complementary relationship controlled by said first control signal and a second complementary relationship controlled by said second control signal.

4,490,583

PLURAL LINE TELEPHONE CONTROLLER

John J. Bednarz, Elmhurst, and William T. Bloodworth, Naperville, both of Ill., assignors to Circom, Inc., Bensenville, Ill.

Continuation of Ser. No. 466,297, Feb. 14, 1983, abandoned. This application May 17, 1984, Ser. No. 611,382
Int. Cl.³ H04M *1/00*
U.S. Cl. 179—99 R **37 Claims**



1. A telephone controller for connecting a single-line telephone to any one of N two-conductor telephone lines, in a local system including a plurality of other single-line telephones equipped with similar controllers, the controller comprising:

a two-conductor telephone bus connected to the input/output terminals of the telephone;

monitor means for detecting an off-hook condition of the telephone;

N interface units each connecting one of the telephone lines to the telephone bus, each interface unit comprising:

off-hook/ring detector means for detecting off-hook and incoming ring signal conditions on the telephone line;

hold latch means actuatable between an unlatched passive condition and a latched hold condition in which the hold latch means connects and maintains a load of predetermined impedance across the telephone line conductors to simulate an off-hook condition;

a telephone line condition indicator connected to the off-hook/ring detector means and to the hold bus line, for visually indicating on-hook, off-hook, incoming ring and hold conditions on the telephone line;

line switch means for connecting the telephone line to the telephone bus;

a line selector switch;

line switch control means for closing the line switch means in response to actuation of the line selector switch;

and line bridge means for maintaining the line switch means closed in response to detection of an off-hook condition by the monitor means;

the telephone controller further comprising:

a hold switch;

hold latch control means, connected to the hold switch and having an input connection from the activity monitor means and output connections to the hold latch means in each interface unit of the controller, for actuating any one of the hold latch means to its latched hold condition upon operation of the hold switch coincident with detection of an off-hook condition by the activity monitor means for the same telephone line as that hold latch means;

and audible signal means, having input connections from the off-hook/ring detector means in each interface unit, for generating an audible signal whenever an incoming ring signal is detected on any of the N telephone lines.

4,490,584

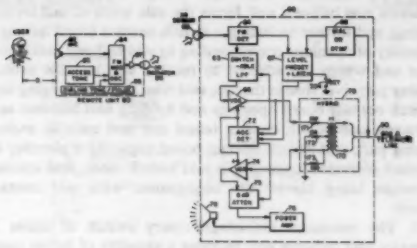
INFRARED REMOTE TELEPHONE SYSTEM LEVEL CONTROL

Robert E. Lacey, Sudbury, Mass., assignor to Controlonics Corporation, Westford, Mass.

Filed Mar. 18, 1983, Ser. No. 476,626

Int. Cl.³ H04M *1/60*

U.S. Cl. 179—100 L **12 Claims**



1. A user communication system comprising:

means for applying user generated signals to a network, said means having controllable gain;

means for receiving signals from the network for local reproduction with controllable signal level; and

means for oppositely adjusting the amplitude of the signals applied to the network and the signal level of the locally reproduced signal according to the level of the user generated signals, wherein:

said means for oppositely adjusting reduces the gain of the applying means as the amplitude of the user generated signals increase.

4,490,585

HEARING AID

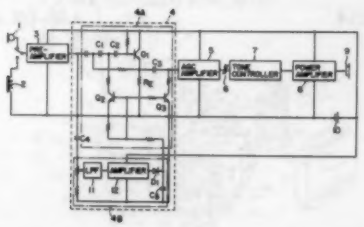
Katsumi Tanaka, Akishima, Japan, assignor to Rion Kabushiki Kaisha, Japan

Filed Oct. 8, 1982, Ser. No. 434,076

Claims priority, application Japan, Oct. 13, 1981, 56-151836[U]

Int. Cl.³ H04R *25/00*

U.S. Cl. 179—107 FD **9 Claims**



1. A hearing aid comprising:

input means adapted for connection to a microphone, for providing an input signal corresponding with audio sound detected by the microphone;

a low frequency detecting and rectifying circuit connected to said input means for providing a control signal proportional to the level of the low frequency noise in the input signal;

a voltage controlled automatic filter circuit connected to said input means for receipt of the input signal therefrom and connected to said low frequency detecting and rectifying circuit for receipt of the control signal therefrom, and responsive to the control signal for passing the input signal as an output signal having low frequency cut-off determined by the value of the control signal to suppress from the output signal low frequency noise in the input signal; and

amplification means connected to said filter circuit and adapted for connection to a speaker for applying the amplified output signal to the speaker for generation of sounds corresponding thereto.

4,490,586

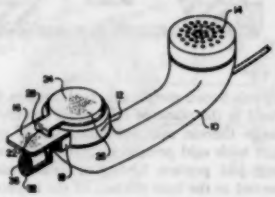
TELEPHONE EAR PIECE LOCK

Melvin D. Oliver, 4310 N. Carlisle St., Philadelphia, Pa. 19140

Filed Sep. 17, 1982, Ser. No. 419,526

Int. Cl.³ H04M *1/66*

U.S. Cl. 179—189 R **4 Claims**



1. A telephone locking device for locking over the receiver end of a telephone instrument comprising

a shield means overfitting the receiver end of the telephone instrument to prevent passage of sound therethrough,

the shield means comprising a generally circular, disk-like cover and a non-movable locking finger integrally extending outwardly from the cover, the locking finger being provided with a lock opening, the opening being spaced from the cover; and

a bracket means permanently secured to the periphery of the telephone instrument near the said end to receive the locking finger,

the bracking means comprising a base and a flat, non-movable arm extending therefrom, the arm having a longitudinal axis, the arm being provided with a slot, the said slot being oriented at right angles to the longitudinal axis of the arm,

the slot being positioned to receive therethrough the portion of the locking finger having the lock opening whereby when the disk-like cover is positioned on one side of the bracket means flat arm the lock opening will be positioned on the side of the flat arm; and a portable lock insertable through the lock opening and being lockable therein,

whereby removal of the locking finger from the flat arm can be prevented.

4,490,587

SWITCH ASSEMBLY

Paul H. Miller, Wheaton, and Charles D. Stelzner, Hoffman Estates, both of Ill., assignors to Microdot Inc., Darien, Conn.

Filed Apr. 7, 1983, Ser. No. 482,832

Int. Cl.³ H01H *13/70*

U.S. Cl. 200—5 A **1 Claim**

1. A flexible switch assembly for providing a signal for use by solid state electronic logic circuitry, said switch comprising:

A. a flexible face cover membrane having a plurality of openings therein;

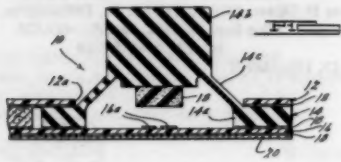
B. a flexible keyboard membrane positioned immediately below the face cover membrane and including a base portion and a plurality of raised hollow contact pad portions projecting upwardly from the base portion through the respective openings in the face cover membrane;

C. a flexible printed circuit board membrane positioned below the keyboard membrane for switching coaction with said contact pad portions;

D. adhesive means bonding said membranes together into a thin, flexible, sealed switch sandwich;

E. said keyboard membrane being formed of a nonconductive ellastomeric material; and

F. a plurality of conductive elastomeric buttons secured to the underside of each contact pad portion, respectively, for coaction with printed circuitry on the upper surface of



the circuit board membrane, said buttons being normally disposed in the plane of said cover membrane within the openings therein and movable out of said plane into contact with said printed circuit board membrane, each contact pad portion having a mesa configuration and connected to the base portion of the keyboard membrane by sloping walls which are configured to allow the contact pad portion to move downwardly through the opening in said face cover membrane with a toggle action to transmit a positive tactile contact signal to the operator.

4,490,588

ROTARY SWITCH

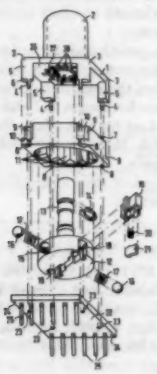
Horst H. Guenther, Ansbach, and Wolfgang Roesl, Heilsbronn, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 18, 1982, Ser. No. 434,952

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1981, 3141550

Int. Cl.³ H01H *19/00, 21/00*

U.S. Cl. 200—11 R **13 Claims**



1. An improved miniature mulitstage rotary switch in which a metallic part of the switch casing comprises a molded part having a threaded bushing molded thereto, said bushing serving as a bearing of the switch spindle and for mounting the switch to a board or panel, and provided with an interior ball-rest unit having at least one detent ball disposed within a rotor connected to the switch spindle, said detent ball biased radially outwardly against and cooperating with a plurality of detent elements disposed on the inner peripheral surface of said ball-rest unit, the improvement comprising: said ball-rest unit being formed of a molded plastic, said ball-rest unit forming a wall of said switch casing and having a plurality of openings which are adapted to receive therein a like number of rivet shanks depending from said switch casing metallic part so as to secure said metallic part of said switch casing to said ball-rest unit when the projecting ends of said rivet shanks are deformed.

2. The miniature multistage rotary switch of claim 1, wherein said ball-rest unit forms the side walls of said switch casing, and further including a switch contact board having a plurality of openings corresponding to said ball-rest unit openings and which are adapted to receive said metallic switch casing part rivet shanks therein, said rivet shanks engaging said switch contact board openings and holding said ball-rest unit between said switch contact board and said metallic switch casing part, said switch contact board engaging a plurality of contact elements supported in said switch rotor, said contact elements being biased into engagement with said contact board.

7. The miniature multistage rotary switch of claim 2, wherein said ball-rest unit includes a plurality of detent cams along the periphery of its inner wall and said switch casing metallic part includes an annular groove formed in the inside surface of said switch casing metallic part for limiting the turning range of said switch rotor, said switch rotor having a stop cam located thereupon, said stop cam being received by and rotatable in said annular groove, said annular groove including a plurality radially slots arranged generally perpendicular to said annular groove said slots corresponding to the number of said detent cams of said ball-rest unit, said slots being adapted to receive at least one locking pin member crossing said annular groove to engage said switch rotor stop cam to limit the operational movement of said switch rotor.

4,490,589

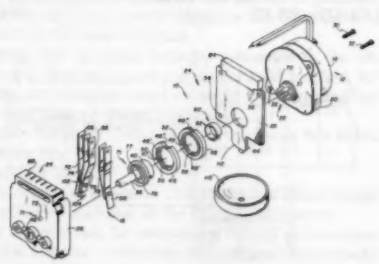
TIMING MECHANISM

Elmo W. Voland, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Oct. 27, 1982, Ser. No. 437,166

Int. Cl.³ H01H *43/10*

U.S. Cl. 200—38 R **12 Claims**



1. A timing mechanism comprising:

(a) a motor drive means having an output member including at least one leg,

(b) a shaft including a circular hub portion having a circular recess therein,

(c) a spring tightly and frictionally held within and against an inner wall of said recess, and at least one tang extending from said spring and engaging said leg.

(d) cam means independently rotatably carried on said hub portion through a bore in said cam means,

(e) coupling means coupling said cam means to said hub portion, and

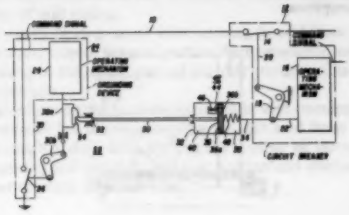
(f) switch means responsive to a rotation of said cam means to be opened and closed thereby.

4,490,590

SWITCHING SYSTEM WITH GROUNDING DEVICE

Setsuyuki Matsuda, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1983, Ser. No. 461,979
Claims priority, application Japan, Feb. 3, 1982, 57-16719; Feb. 3, 1982, 57-16720
Int. Cl.³ H01H 9/20
U.S. Cl. 200—50 C 7 Claims



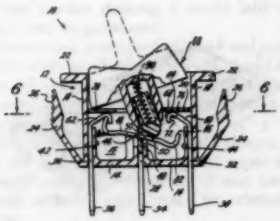
1. A switching system comprising:
an electric path,
a circuit breaker connected to said electric path,
a first operating mechanism for opening and closing said circuit breaker,
a grounding device for said electric path,
a second operating mechanism for closing and opening said grounding device,
a means for locking said grounding device in an open state, and
a locking control means for interlocking itself with said first operating mechanism and, responsive to an interruption by said circuit breaker, to be driven to release said locking means from its locking state, after which said locking control means causes said locking means to be returned to its locking state.

4,490,591

ELECTRIC SWITCH WITH CLEANING ACTION

Paul F. Page, Newington, Conn., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Dec. 10, 1982, Ser. No. 448,591
Int. Cl.³ H01H 5/06, 21/40
U.S. Cl. 200—68.2 9 Claims



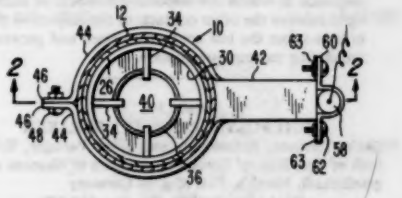
1. An electric switch, comprising:
(a) a housing;
(b) a first fixed terminal defining a single-point fulcrum pivot surface mounted in said housing;
(c) a second fixed terminal having separate contact make, hold and break surfaces mounted in said housing;
(d) a bridging contact member having an essentially flat midsection adapted to be pivotally supported by said first fixed terminal fulcrum pivot surface, said bridging contact member being selectively moveable into and out of engagement with said second fixed terminal;
(e) shifting means for shifting said bridging contact member from initial engagement with said second fixed terminal make surface into engagement wiht said second fixed terminal hold surface; and
(f) over-center switch operating means moveable between two positions for selectively shifting said bridging contact member into engagement and out of engagement with said second fixed terminal.

4,490,592

MAGNETIC FLOW SWITCH

Ernest Haile, 30 Cadwallader Ter., Trenton, N.J. 08618

Filed Jun. 4, 1982, Ser. No. 408,166
Int. Cl.³ H01H 35/40
U.S. Cl. 200—81.9 M 16 Claims



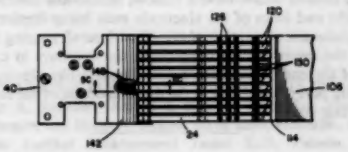
1. A magnetic flow switch comprising:
(a) a pressure fluid conduit;
(b) a skeletal cylinder of a magnetically attractive material comprising ring portions connected by arms defining openings therebetween, the cylinder being slidable within said conduit and adapted to be slidably shifted therein from a rest position to a use position by pressure fluid flowing within the conduit; and
(c) a magnet and switch assembly mounted on the conduit and including a magnet attracted by the skeletal cylinder when the skeletal cylinder reaches its use position, and an electrical switch actuated responsive to the attraction of said magnet by the skeletal cylinder.

4,490,593

ARRANGEMENT FOR ARC TRANSFER IN HIGH AMPERAGE MOLDED CASE CIRCUIT BREAKER

James W. Cook, Solon, Iowa, assignor to Square D Company, Palatine, Ill.

Filed May 9, 1983, Ser. No. 493,116
Int. Cl.³ H01H 33/20
U.S. Cl. 200—144 R 16 Claims



1. In a multiphase molded case circuit breaker including a plurality of contact blades for each phase arranged to carry alternating current in a selected range between 800 and 3000 amperes, with each blade carrying a blade contact intermediate the ends of the respective blade and having a respective carrier for each phase adapted to pivot a free end of the respective blades in one direction about a blade pivot axis for engaging a respective stationary contact to establish a connection between a line conductor and a load conductor for each phase with each contact adapted to generate an arc in response to pivot movement of the respective carrier and the respective blades in the opposite direction during current interruption under the influ-

ence of respective overtravel springs located between each carrier and the respective blades, the improvement comprising:

bar means on each blade adjacent the free end of each blade and having a bar portion overlapping the respective blade,

a carrier portion on each carrier located between each respective bar portion and the respective blades,

and a respective adjustment member adjustably passing through each bar portion overlapping the respective blade for engagement by the respective carrier portion in response to pivoting of the respective carrier a respective predetermined distance in said opposite direction whereafter the respective adjustment member and bar means are pivoted in said opposite direction to pivot the respective blade in said opposite direction for separating the respective blade contact from the respective stationary contact whereby the adjustment of each member controls the sequence in which the respective contacts of each phase open relative the other contacts of the respective phase to in turn select the last contacts to open and generate said arc during current interruption.

4,490,594

HIGH VOLTAGE CIRCUIT BREAKER

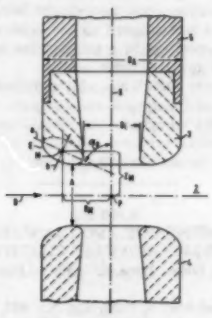
Wilhelm Tiemann, Bubenreuth, and Jobst Verleger, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,490

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209968

Int. Cl.³ H01H *33/72*

U.S. Cl. 200—148 R **8 Claims**



1. In a high voltage circuit breaker comprising two electrodes both of which have a hollow, nozzle-like electrode end, with the end faces of the electrode ends being formed so that high dielectric strength is obtained with small spacing between ends, the improvement comprising the contours in cross-section of the end faces of the hollow, nozzle-like electrode ends forming part of an ellipse in the axial direction of the respective electrode ends.

4,490,595

ELECTRIC DISCONNECT OR GROUNDING SWITCH HAVING A MOVABLE SWITCH BLADE

Manfred Meinherz, and Jorg Tietze, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

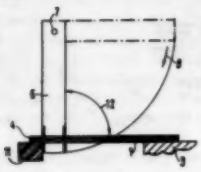
Filed Feb. 8, 1983, Ser. No. 464,898

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1982, 3204438

Int. Cl.³ H01H *1/42*

U.S. Cl. 200—254 **2 Claims**

1. A disconnect or grounding switch comprising a knife blade pivotable about a fulcrum, a fixed blade contact disposed at a distance from the fulcrum less than the length of the knife blade, the knife blade being at an angle with or parallel to the fixed blade contact when the switch is in an open condition and perpendicular to the fixed blade contact when the switch is in a closed condition, the fixed blade contact having a central slot open at one end and closed at the other end, and spaced resilient current contacts formed by the slot in the fixed blade contact adjacent the open end of the slot, the knife blade being disposed in the slot perpendicular to the fixed blade contact in the closed condition of the switch with the resilient contacts laterally urged against the knife blade, wherein the improvement comprises:



the knife blade when the switch is in its open condition being on the same side of the fixed blade contact as the fulcrum, the knife blade when being pivoted about the fulcrum from the open to the closed condition of the switch entering the slot and moving into contact with the current contacts from the closed end of the slot, the switch further comprising an insulating stop disposed adjacent to the current contacts on the side of the fixed blade contact opposite to the fulcrum, the knife blade resting against the stop in the closed condition of the switch.

4,490,596

INDUCTION COOKING APPARATUS HAVING COOLING ARRANGEMENT THEREFOR

Yukio Hirai, Takarazuka; Keizo Amagami, Takatsuki; Takao Kobayashi, Hirakata, and Shinichi Matsumoto, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

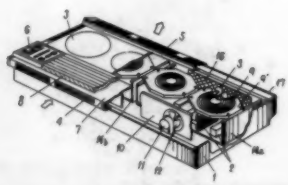
PCT No. PCT/JP81/00414, § 371 Date Aug. 5, 1982, § 102(e) Date Aug. 5, 1982, PCT Pub. No. WO82/02313, PCT Pub. Date Jul. 8, 1982

PCT Filed Dec. 25, 1981, Ser. No. 405,954

Claims priority, application Japan, Dec. 26, 1980, 55-186367

Int. Cl.³ H05B *6/12*

U.S. Cl. 219—10.49 R **6 Claims**



1. An induction heating type cooking apparatus comprising:

a casing defining a compartment therewithin;

a single pan supporting panel of non-magnetic high mechanical strength on said casing and defining at least a part of the top of said compartment;

a partition plate extending along and under said pan supporting panel and supporting said panel and dividing said compartment into a front portion and a rear portion and blocking counterflow of cooling air from said rear portion to said front portion, said partition having an opening therein between said portions;

a plurality of induction heating coils in said rear portion spaced from the under side of said panel;

solid state power conversion means for each heating coil and positioned in said rear portion and connected to the corresponding heat coil;

operating circuit means for each of the respective coils and including power switch means, power adjusting means for adjusting the power to the corresponding coil and display means for displaying the power input level, said operating circuit means being positioned in said front portion and electrically connected to the corresponding coils and having the operating controls for the switch means and the adjusting means and the display means exposed on the top of said casing;

said casing having an air inlet opening in said front portion and an outlet in the rear poriton open upwardly out of said casing at the upper part of the rear portion of said compartment;

a forced air cooling means mounted in said opening in said partition for drawing cooling air into said front portion through said air inlet, forcing the cooling air through said opening and through said rear portion and discharging it out through said air outlet.

4,490,597

MICROWAVE PERMEABLE PRESSURE COMPENSATING CONTAINER

Clare L. Mengel, 5530 Longfellow Rd., Santa Barbara, Calif. 93111

Continuation-in-part of Ser. No. 76,995, Sep. 19, 1979, abandoned. This application Sep. 28, 1982, Ser. No. 425,334

Int. Cl.³ H05B *6/80*; A47J *27/088*

U.S. Cl. 219—10.55 E **5 Claims**

1. A pressure compensating container comprising:

a base portion including a bottom member and upwardly projecting sidewalls which terminate at an upper surface, said base portion defining a cavity into which a food product may be positioned;

a threaded portion positioned adjacent said upper surface on said upwardly projecting sidewalls of said base portion;

a closure lid adapted to mate with said upper surface of said upwardly projecting sidewalls for forming a closure for said cavity;

a threaded portion positioned on said closure lid for mating with said threaded portion on said upper surface of said upwardly projecting sidewalls of said base portion for securely retaining said closure lid relative to said base portion;

said closure lid including an aperture disposed therein;

a valve member operatively positioned for selectively closing said aperture in said closure lid;

a bracket secured to said closure lid and being disposed adjacent to said aperture and including a portion spaced a predetermined distance above said closure lid;

resilient biasing means operatively positioned between said bracket and said closure lid for selectively retaining said valve member in a closed position relative to said aperture;

adjusting means disposed on the top of said bracket portion and in engagement with said resilient biasing means for adjusting the amount of pressure of said resilient biasing means exerted on said valve member,

said valve member, said adjusting means and said resilient biasing means forming a resiliently biased pressure regulating valve in operative communication with said cavity to selectively vent said cavity of steam or vapor when microwave radiation or heat is applied thereto;

said base portion, said closure lid and said valve member being constructed of a microwave permeable material.

4,490,598

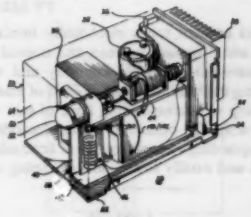
BLOOD TUBING SEALING UNIT

Stephen C. Minney, and Daniel C. Harmony, both of Tucson, Ariz., assignors to Engineering & Research Associates, Inc., Tucson, Ariz.

Filed Sep. 30, 1982, Ser. No. 429,272

Int. Cl.³ H05B *9/24*

U.S. Cl. 219—10.81 **8 Claims**



1. Apparatus including a fixed jaw cooperating with a moveable jaw for squeezing tubing placed therebetween and welding the squeezed tubing by irradiating the tubing with RF energy, said apparatus comprising in combination:

(a) a sealing head having a spheroid surface to provide uniform heat radiation in different directions, said sealing head including said fixed jaw;

(b) a channel extending through said sealing head defined in part by said fixed jaw and in general alignment with said fixed jaw for accommodating flow through said sealing head of any fluid which may emanate from the tubing on bursting of the tubing during welding of the tubing;

(c) a cavity disposed within said sealing head;

(d) a bushing slidably disposed within said cavity for supporting said moveable jaw;

(e) means for attaching said moveable jaw to said bushing;

(f) means for moving said bushing to squeeze the tubing against said fixed jaw by said moveable jaw; and

(g) means for transmitting RF energy between said moveable and fixed jaws to heat and weld the tubing placed therebetween.

4,490,599

APPARATUS FOR FLASH WELDING OF PIPES

Vladimir K. Lebedev; Sergei I. Kuchuk-Yatsenko; Vasily A. Sakharnov, and Boris A. Galian, all of Kiev, U.S.S.R., assignors to Institut Elektrovarki Imeni E.O. Patona, Kiev, U.S.S.R.

Filed Aug. 24, 1981, Ser. No. 295,568

Int. Cl.³ B23K *11/04, 11/32*

U.S. Cl. 219—61.1 **1 Claim**

1. An apparatus for flash welding of pipes, designed to operate inside the pipes and comprising:

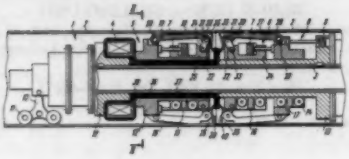
an elongated supporting member whose axis can coincide with the axis of the pipes to be welded, an axially movable clamping assembly for clamping one of the pipes to be welded, mounted on said elongated supporting member and carrying electrode jaws;

a flashing and upsetting assembly operatively connected with said axially movable clamping assembly for aligning

the pipes to be welded as flashing and upsetting actions proceed;

an axially immovable clamping assembly for clamping the other one of the pipes to be welded, mounted on said elongated supporting member in spaced circumferential relationship therewith and carrying electrode jaws;

a doughnut-type welding transformer mounted on said elongated supporting member adjacent the side of said axially immovable clamping assembly, which is distant from the electrode jaws thereof; and



two coaxial contact tubes electrically insulated from one another and disposed between and coaxial with said axially immovable clamping assembly and said elongated supporting member, one end of each of said contact tubes terminating at corresponding taps, of said welding transformer, while the other one being electrically connected to corresponding electrode jaws of both said axially movable and said axially immovable clamping assemblies.

4,490,600

WIRE ELECTRODE SPARK EROSION

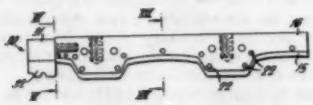
Malcolm C. Rae, Redhill, England, assignor to Redland Roof Tiles Limited, Surrey, England

Filed Feb. 4, 1982, Ser. No. 346,121

Claims priority, application United Kingdom, Feb. 13, 1981, 8104525

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 W **9 Claims**



1. A method of making a hardmetal surfaced slipper for a tile making machine, the method comprising first making a hardmetal lamina by the steps of making a first cut by wire electrode spark erosion through a block of hardmetal, and making a second cut by wire electrode spark erosion through the block, the second cut being generally parallel to the first, to form a lamina of hardmetal between the two lines of cut, said lamina comprising a single piece of hardmetal having a continuous non-interrupted surface, and then securing the single piece lamina to the surface of a mounting bolster shaped to receive the lamina, thereby to form the complete slipper surface.

4,490,601

APPARATUS FOR MANUFACTURING METALLIC FINE PARTICLES USING AN ELECTRIC ARC

Tohei Yokoyama, Kyoto, Japan, assignor to Kubushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho, Osaka, Japan

Filed Feb. 25, 1983, Ser. No. 469,668

Claims priority, application Japan, Mar. 5, 1982, 57-35610

Int. Cl.³ B22F *9/10, 9/14;* **B23P** *1/06*

U.S. Cl. 219—69 R **6 Claims**

1. An apparatus for manufacturing metallic fine particles from a metallic material, having at least one arc-discharging section in which the material is heated and melted, the apparatus comprising

a rotary body,

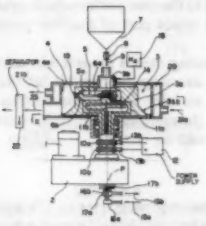
a hollow interior cavity in said body,

at least one arc-discharging section in said hollow interior cavity of said rotary body,

means for rotating said rotary body at a high rotational speed,

a passage in said rotary body for supplying therethrough said metallic material to said at least one arc-discharging section during rotation of said rotary body,

a fine radially extending aperture in a peripheral portion of



said rotary body radially of said at least one arc-discharging section through which melted metallic material is centrifugally discharged,

a stationary casing surrounding said rotary body which forms a confined space about said rotary body,

said casing including a cooled stationary wall upon which melted metallic material centrifugally discharged through said aperture in said body impinges to thereby form fine particles,

cooling means for cooling said stationary wall, and

an outlet passage in said stationary wall of said casing through which said fine particles formed in said casing are withdrawn.

4,490,602

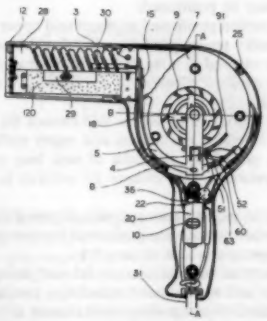
AIR FLOW ADJUSTING MECHANISM FOR HAND HELD HOT AIR HAIR DRYER

Naoki Ishihara, Flat 209, Viking Villa, 70 Tin Tau Temple Rd., Hong Kong, Hong Kong

Filed Feb. 18, 1983, Ser. No. 467,494

Int. Cl.³ A45D *20/12;* **F01B** *25/02;* **F24H** *3/04;* **H05B** *1/00*

U.S. Cl. 219—370 **6 Claims**



1. A hot air hand held hair dryer comprising an outer housing; an inner housing within said outer housing; nozzle means connected to said outer housing for exhausting air; motor; fan disposed within said inner housing and driven by said motor; electrical heater means disposed within said nozzle means;

whereby said motor drives said fan to circulate air within said inner housing and to contact said electrical heater means for heating the air prior to exhausting through said nozzle; and adjusting means for providing an adjustable opening in said inner housing to provide an outlet from said inner housing to a space between said inner housing and said outer housing for a portion of air flow being circulated from said fan.

4,490,603

ELECTRIC HOTPLATE WITH A MOUNTING RING AROUND IT

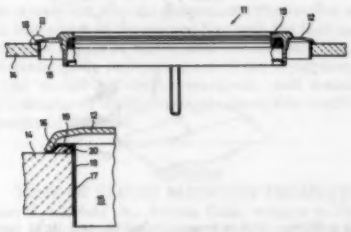
Karl Fischer, Am Gänsberg 23, 7519 Oberderdingen, Fed. Rep. of Germany, and Felix Schreder, Oberderdingen, Fed. Rep. of Germany, assignors to Karl Fischer, Fed. Rep. of Germany

Filed Aug. 3, 1982, Ser. No. 404,691

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1981, 3137463

Int. Cl.³ H05B 3/68

U.S. Cl. 219—463 7 Claims



1. A cooking apparatus comprising:

an electric hotplate having a hotplate body of cast material with slots in an underside thereof and heating resistors located in said slots, and a mounting ring surrounding an outer circumference of the hotplate body, the hotplate with the mounting ring being fitted to a mounting opening of a mounting plate, the plate being at least one of glass and ceramic, the hotplate being connected to the mounting plate by a first adhesive joint between the mounting ring and the mounting plate, an insert ring covering a wall of the mounting opening, and the insert ring being connected by a second adhesive joint between the insert ring and at least one of the mounting ring and the mounting plate.

4,490,604

INPUT/OUTPUT DEVICE ARRANGEMENTS FOR TERMINALS

Clifford D. Read, Almonte; Bruce I. Dolan, and Paul D. McDonald, both of Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 13, 1982, Ser. No. 407,778

Int. Cl.³ G06C 7/02

U.S. Cl. 235—146 21 Claims

1. A computer or telecommunications terminal comprising a cabinet having top and bottom surfaces, a housing formed by one part of the bottom surface for housing a lamellar input-/output device, another part of the bottom surface being spaced from an underlying planar support surface in a normal operating position of the terminal to permit tilting thereof thereby to lower the other part and to raise said one part of the cabinet bottom surface sufficiently high from the support surface to permit the lamellar input/output device to be slid freely along the support surface from under the cabinet.

4,490,605

PHOTOELECTRIC DETECTION STRUCTURE

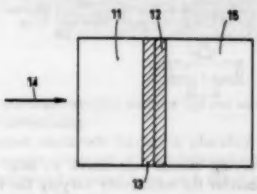
Pierre Dolizy, Ris-Orangis, and Francoise Grolière, Nogent-sur-Marne, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 8, 1982, Ser. No. 337,917

Claims priority, application France, Jan. 21, 1981, 81 01039

Int. Cl.³ H01J 31/50

U.S. Cl. 250—213 VT 20 Claims



1. A photoelectric detection device for detecting radiation in a given spectral region, said device comprising:

an envelope enclosing an evacuated space;

a substrate on the envelope, said substrate being transparent to radiation in the spectral region;

an intermediate layer provided inside the envelope on the substrate, said intermediate layer being transparent to radiation in the spectral region; and

a photosensitive layer provided inside the envelope on a side of the intermediate layer opposite to the substrate, said photosensitive layer having a first side adjacent to the intermediate layer and a second side opposite to the first side, said photosensitive layer having an escaping depth of photoelectrons;

characterized in that:

the substrate, the intermediate layer, and the photosensitive layer each have a refractive index, the refractive index of the intermediate layer being between the refractive index of the substrate and the refractive index of the photosensitive layer; and

the intermediate layer and the photosensitive layer each have thicknesses chosen so that absorption of radiation in the spectral region occurs substantially in a portion of the photosensitive layer adjacent to the second side of the photosensitive layer and said portion having a thickness on the order of magnitude of the escaping depth of photoelectrons in the photosensitive layer.

4,490,606

TRANSDUCER APPARATUS UTILIZING FIBER OPTICS FOR DATA TRANSMISSION

James F. Lockett, Missouri City; Miles A. Smither, Houston, and Jerry F. Janecka, Corpus Christi, all of Tex., assignors to Geosource Inc., Houston, Tex.

Filed Apr. 26, 1982, Ser. No. 371,782

Int. Cl.³ G02B 5/14

U.S. Cl. 250—227 10 Claims

1. A transducer adapted to receive an input optical signal and responsive to a predetermined parameter which is to be

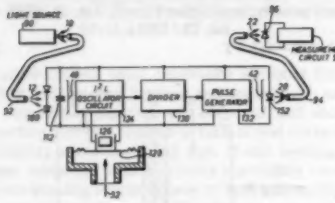
measured, for generating an output optical signal in a dependence to said parameter, said transducer comprising:

a first optical coupling means having a first end for receiving said input optical signal and a second end for transmitting said input optical signal;

first conversion means optically coupled to said second end of said first optical coupling means for receiving said input optical signal and for generating an electrical power signal;

driver means powered by said electrical power signal and responsive to said predetermined parameter for generating an electrical drive signal representative of said predetermined parameter, said driver means including:

oscillator circuit means having a selectively variable frequency of oscillation for producing an oscillatory signal;



frequency varying means responsive to said predetermined parameter for selectively varying the frequency of oscillation of said oscillator circuit means to selectively vary said oscillatory signal in dependence on said parameter; and

output means connected to receive said oscillatory signal for providing said electrical drive signal in dependence on said oscillatory signal;

second conversion means connected to receive said electrical drive signal for generating said output optical signal in dependence on said electrical drive signal; and

second optical coupling means having a first end for receiving said output optical signal and a second end for transmitting said output optical signal.

4,490,607

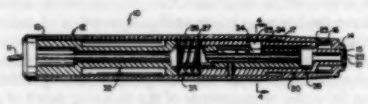
PINHOLE OBJECTIVE FIBRE OPTIC LIGHT PEN

Logan L. Pease, and Wes F. Carmean, both of Reno, Nev., assignors to IGT, Reno, Nev.

Filed Jul. 22, 1982, Ser. No. 400,796

Int. Cl.³ G09F 9/00

U.S. Cl. 250—227 **9 Claims**



1. A light pen, comprising:

an elongate barrel having a tip portion and a base portion, said base portion adapted to secure a light conductive fibre cable end segment thereto, said barrel adapted to receive said light conductive fibre cable therein:

a sleeve positioned at the tip portion of said barrel and axially movable relative thereto between extended and retracted positions;

a pin-hole objective formed within said sleeve for focusing light onto said light conductive fibre cable end when the sleeve is in its retracted position; and

means for urging said sleeve to the extended position wherein said sleeve projects axially outward from the tip portion of said barrel, whereby said sleeve may be pressed to the retracted position axially inward from the tip portion of said barrel to focus light present at said pinhole objective onto said light conductive fibre cable end.

4,490,608

POSITION SENSOR

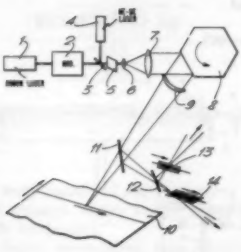
Edward C. Yeadon, and Richard W. Lacey, both of London, England, assignors to Crosfield Electronics Limited, London, England

Filed Oct. 14, 1981, Ser. No. 311,474

Claims priority, application United Kingdom, Oct. 21, 1980, 8033885

Int. Cl.³ H01J 40/14

U.S. Cl. 250—235 **12 Claims**



1. In a flying spot scanner including one light source for producing a beam of light, a photosensitive surface, means for scanning said light beam across said photosensitive surface, and means to produce a signal representative of the position of said beam of light in its direction of scanning; the improvement whereby a transverse beam position sensor is included, said transverse beam position sensor comprising:

one ruled elongate grating;

means to take part of said beam of light from said means for scanning and apply it to said ruled elongate grating whereby it scans in a direction along said ruled elongate grating;

rulings of said ruled elongate grating forming an oblique angle with said scanning direction of said part of said beam of light along said ruled elongate grating;

a photodetector arranged to monitor interaction of said part of said beam of light with said ruled elongate grating and output a signal dependent upon said interaction; and,

means to mix said output signal from said photodetector with said signal representative of said position of said beam of light to provide a phase modulated signal, the phase modulation of said signal providing an indication of the position of said scanning beam of light in a direction transverse to its scanning direction.

4,490,609

METHOD AND APPARATUS FOR ANALYZING WELL FLUIDS BY PHOTON IRRADIATION

Philippe Chevalier, Verrieres le Buisson, France, assignor to Schlumberger Technology Corporation, Houston, Tex.

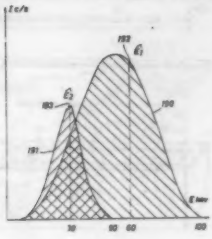
Filed Jun. 23, 1982, Ser. No. 391,320

Int. Cl.³ G01V 5/12

U.S. Cl. 250—269 **22 Claims**

1. A method for measuring the absorption of a photon flux by the fluid flowing in an oil well lined with a metal casing to produce measurements related to the composition of the fluid, comprising the steps of lowering in the well an elongated sonde having a photon source and at least one detector disposed at longitudinally spaced locations, producing by means of the source a photon flux with an energy spectrum below

such a predetermined level that the walls of the metal casing substantially absorb the photons impinging thereon, said flux including first photons with a low energy level at which photoelectric absorption is significant and second photons with a high energy level at which Thomson scattering is predominant, directing the photon flux to irradiate the fluid surrounding the sonde symmetrically about its axis, detecting by means



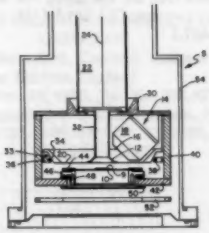
of said at least one detector the resultant photon flux produced by the interaction of the emitted flux with the fluid and deriving from the output of said at least one detector first and second measurements representatives of the absorptions of said first and second photons, respectively, said measurements being indicative of the photoelectric absorption coefficient and the density of the fluid.

4,490,610

TIME OF FLIGHT MASS SPECTROMETER

William H. Ulbricht, Jr., Arvada, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 3, 1982, Ser. No. 414,745
Int. Cl.³ B01D 59/44
U.S. Cl. 250—287 **5 Claims**



1. A time-of-flight mass spectrometer for obtaining a mass spectrum of a sample of interest in the said state, said sample having at least one surface comprising:

a means for supporting the sample to be analyzed,

a quantity of fissile material positioned relative to said supporting means, said material being such that when a nucleus of the material undergoes fission it will be split into two fragments, a first fragment which will be emitted from said source to impinge upon a surface of said sample and desorb ions from said surface and a second fragment which will be emitted in about the opposite direction,

a flight region positioned to receive said desorbed ions,

means for accelerating said desorbed ions away from said sample surface and into said flight region,

means for detecting said second fission fragment emitted from said fissile material at about the same moment that ions are desorbed from said sample surface, said means generating a first electrical signal when said second fission fragment is detected,

means for detecting said desorbed ions, said means positioned at the end of said flight region opposite said sample, said means generating a second electrical signal when a desorbed ion is detected, and

means for measuring the time elapsed between said first electrical signal and said second electrical signal, said time being determinative of the mass of each desorbed ion respectively.

4,490,611

ONE-DIMENSIONAL SCANNER HAVING STAGGERED AND OVERLAPPING ELECTRODES

Souichi Sekimoto, and Ryoki Kato, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Division of Ser. No. 295,284, Aug. 24, 1981,. This application Sep. 22, 1983, Ser. No. 534,883
Claims priority, application Japan, Dec. 4, 1980, 55-170252
Int. Cl.³ G03G 5/00
U.S. Cl. 250—316.1 **6 Claims**

1. A one-dimensional scanner for use in an image producing device comprising:

an upper electrode having a plurality of upper electrode elements arranged at a predetermined pitch and at a predetermined spacing from each other in a one-dimensional scanning direction;

a lower electrode having a plurality of lower electrode elements arranged at a predetermined pitch and at a predetermined spacing from each other in said one-dimensional scanning direction in an opposed, spaced and staggered relation to said plurality of upper electrode elements so that each lower electrode element is positioned across two adjacent upper electrode elements thereby defining a first picture element region between said each lower electrode element and one of said two adjacent upper electrode elements and a second picture element region between said each lower electrode element and the other of said two adjacent upper electrode elements;

a layer of electric-radiant-energy-converting material disposed between said upper electrode and said lower electrode; and

one-dimensional scanning means adapted to select respective pairs of upper and lower electrode elements overlapping each other sequentially in said one-dimensional scanning direction, thereby selecting picture element regions one after another in said scanning direction, thereby effecting one-dimensional scanning;

time serial electrical signals being applied to each pair of selected upper and lower electrodes whereby an image is reproduced on a recording medium by radiant energy.

4,490,612

METHOD FOR THE MEASUREMENT OF THE PROPERTIES OF A PLASTIC FILM BY MEANS OF INFRA-RED RADIATION

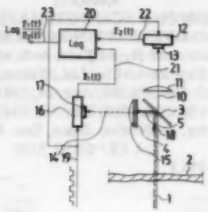
Sauli J. Törmälä, Espoo, Finland, assignor to Topwave Instruments Oy, Helsinki, Finland

Filed Aug. 12, 1982, Ser. No. 407,386
Claims priority, application Finland, Aug. 18, 1981, 812546
Int. Cl.³ G01J 1/00
U.S. Cl. 250—339 **18 Claims**

1. Method for the measurement of the properties, particularly of the thickness, of a plastic film by transmitting at least one beam of infrared radiation through the film to be mea-

sured, whereby part of said beam is absorbed in the film concerned, comprising:

separating from the entirety of said beam that has passed through the film a first wavelength band, and separating from the entirety of said beam a second wavelength band, whose wavelength is close to said first band, said first band being placed substantially at the absorption peak of the plastic material of the film to be examined;



simultaneously passing the radiation included in said first band to a first detector for detection and passing the radiation included in said second band to a second detector for detection; and

calculating the ratio of the output signals of both detectors, on the basis of which ratio it is possible to establish a value of the desired property of the plastic film to be examined at the point of measurement.

4,490,613

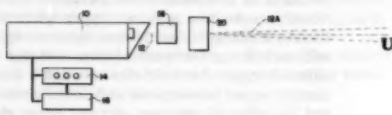
INFRARED HYDROCARBON REMOTE SENSOR

Durward B. Brame, 2510 Richmond Dr., Arlington, Tex. 76014

Filed Jan. 29, 1982, Ser. No. 343,781

Int. Cl.³ G01J *5/08, 5/48*

U.S. Cl. 250—341 **15 Claims**



1. A method of locating potential oil and gas deposits in the earth comprising:

directing a beam of coherent high intensity infrared radiation into the atmosphere above and adjacent the earth's surface, the wave length of the beam being selected such that it energized selected hydrocarbon gas molecules;

scanning the beam of infrared radiation in a preselected pattern; and

detecting re-radiation generated by the energized hydrocarbon gas molecules.

4,490,614

HOUSING FOR AN IONIZATION DETECTOR ARRAY IN A TOMOGRAPHIC SCANNER

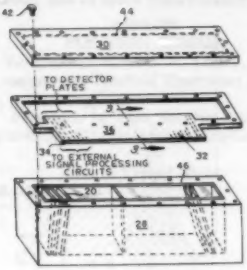
B. David Peerenboom, Kildeer, and Kenneth L. Sypal, Glen Ellyn, both of Ill., assignors to Interad Systems, Inc., Schaumburg, Ill.

Filed Apr. 30, 1982, Ser. No. 373,431

Int. Cl.³ G01T *1/18;* **H02G** *13/08*

U.S. Cl. 250—385 **4 Claims**

1. A sealed housing for electrical apparatus, said housing comprising at least two mating sections which, upon assembly and juxtaposition one to another, form a closed interior chamber; a gasket comprising a flexible layer of electrically insulating material disposed between the mating sections of said housing, a plurality of electrically conductive strips being imbedded within said gasket and extending between the interior chamber and the exterior of the housing to define an electrical feedthrough; and an "O"-shaped sealing ring disposed in the mating surface of each of said two mating sections of the housing, said sealing rings being laterally offset one from



the other and positioned such that when said mating sections are assembled and juxtaposed, each sealing ring presses against said flexible gasket and then against the mating surface of the opposing mating section of the housing.

4,490,615

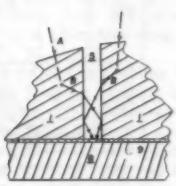
X-RAY INTENSIFYING SCREEN

Esko Rilhimäki, Espoo, and Ossi Korhola, Helsinki, both of Finland, assignors to Radiographic Screen Oy, Finland

Filed Oct. 30, 1981, Ser. No. 316,741

Int. Cl.³ G01J *1/58*

U.S. Cl. 250—487.1 **2 Claims**



1. An X-ray intensifying screen for transforming X-rays into light to aid in the exposure of X-ray film, consisting essentially of:

a planar screen member made of a homogeneous mixture of material which transforms X-rays into light rays and a binding agent, said screen member having a first plane surface and a second surface adapted to face the X-ray film, said second surface including a plurality of spaced shaped recesses therein adapted to be filled only with air,

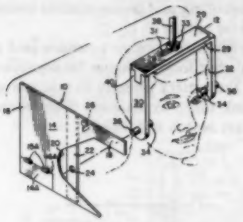
said recesses converging from a widest point adjacent said second surface so that the light rays are guided toward the X-ray film, said material which transforms X-ray being chosen from the group consisting of calcium tungstate, barium and phosphors containing rare earth metal, and said binding agent chosen from the group consisting of polyethylene, silicone compounds, acrylic plastic, polytetrafluoroethylene and cast plastic, the width of said screen being 0.1 to 4.00 mm and the diameter of said recesses being 0.01 to 0.5 mm.

4,490,616

CEPHALOMETRIC SHIELD

John J. Cipollina, 190-18 Haywood Rd., Hollis, N.Y. 11423, and Laurance E. Jerrold, 82 Laurel Dr., Massapequa Park, N.Y. 11762

Filed Sep. 30, 1982, Ser. No. 429,021
Int. Cl.³ G21C 11/00; G21F 1/00
U.S. Cl. 250—515.1 10 Claims



1. A radiation shield adapted to be used in combination with an X-ray tube and a cephalometric X-ray head holder containing alignment ear rods comprising:

a shield surface constructed of a material which is impervious to radiation, said surface adapted to be placed between the skull of the patient and the X-ray beam; and

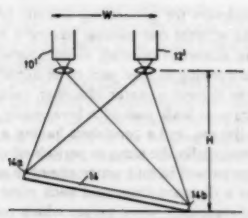
alignment means attached to said shield surface, said alignment means containing an aperture for cooperation with the alignment ear rods of the cephalometric head holder.

4,490,617

OPTICAL WIDTH MEASURING SYSTEM USING TWO CAMERAS

Peter W. Loose, Chelmsford, England, assignor to European Electronic Systems Limited, England

Filed Nov. 25, 1980, Ser. No. 210,337
Claims priority, application United Kingdom, Nov. 26, 1979, 7940810; Mar. 19, 1980, 8009285; Mar. 25, 1980, 8010048
Int. Cl.³ G01N 21/86
U.S. Cl. 250—560 9 Claims



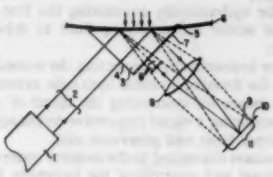
1. A system for measuring the width of a strip being worked, comprising two arrays of radiation responsive elements constituting two sensors located at a predetermined distance from one another above the strip and each arranged to scan both edge portions of the strip, means for generating from the output of said sensors signals representative of the angular position of each edge of the strip relative to said sensors and means for determing from said signals the spatial positions of said edges relative to said sensors thereby enabling the width of the strip to be evaluated, the evaluated width being independent of any inclination of the plane of the strip relative to the two sensors.

4,490,618

OPTICAL SYSTEM FOR ANALYZING THE SURFACE OF A FIBROUS WEB

Paolo G. Cielo, Montreal, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Apr. 12, 1982, Ser. No. 367,686
Int. Cl.³ G01N 21/86
U.S. Cl. 250—571 10 Claims



1. Apparatus for analysing the surface of a fibrous web comprising:

a prism having first and second refractive surface and a back surface, one refractive surface being adapted to be in contact with the fibrous web under a predetermined pressure;

a light source means;

a first radially graded-index lens with one end fixed to the back surface of the prism for collimating a light beam from the light source means and directing the collimated beam into the prism onto the contact surface;

a detector means;

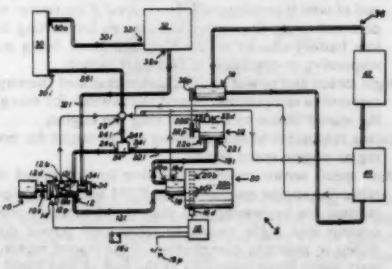
a second graded-index lens with one end fixed to the back surface of the prism for focussing light received from the contact surface through the prism and directing the light onto the detector means, whereby the detector means senses light reflected by the contact surface and light diffracted at the contact surface to indicate the surface condition of the fibrous web.

4,490,619

HYDRAULICALLY DRIVEN GENERATOR SYSTEM WITH AIR CONDITIONING MEANS

Robert R. McMinn, Crosby, Tex., assignor to Harrison Equipment Co., Inc., Stafford, Tex.

Filed Mar. 16, 1983, Ser. No. 475,913
Int. Cl.³ F01K 15/00
U.S. Cl. 290—2 15 Claims



1. A hydraulically driven electric generator and secondary load system for simultaneously generating controlled quality electrical power and producing power to a secondary load, comprising:

a hydraulic pump for pumping a hydraulic fluid;

drive means for driving said pump;

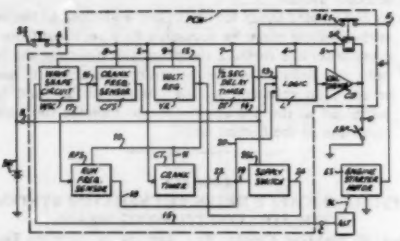
a first hydraulic motor;
means for hydraulically connecting the pump to the first hydraulic motor for supplying fluid to drive the motor;
electrical generating means for generating an electrical output;
means for connecting the first motor to the generating means so that the motor can drive the generating means;
a second hydraulic motor for providing power to a secondary load;
means for hydraulically connecting the first motor to the second motor for supplying fluid to drive the second motor;
means for hydraulically connecting the second motor to the pump for forming a closed hydraulic system;
monitor means for monitoring the speed of said generator and producing a signal responsive to changes detected in the output from said generator; and,
control means connected to the monitor means for receiving said signal and controlling the hydraulic fluid displacement of the hydraulic pump and maintaining an essentially constant output of said generator in response to said signal.

4,490,620

ENGINE STARTER PROTECTIVE AND CONTROL MODULE AND SYSTEM

James E. Hansen, Oak Creek, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 12, 1983, Ser. No. 531,808
Int. Cl.³ F02N 11/08
U.S. Cl. 290—38 R **14 Claims**



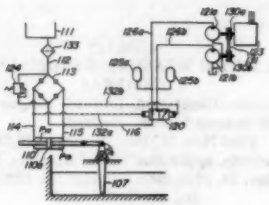
11. A protective system supplied from a battery for controlling an enginel starter motor comprising:
a start switch effective when operated for controlling the starter motor to cause cranking rotation of the engine;
a start speed timer for timing an initial time interval at the end of which cranking will be stopped if the starter motor does not rotate the engine fast enough for starting due to low battery charge or the like, said timer being started responsive to operation of said start switch;
logic means and power control means operated thereby also responsive to operation of said start switch for energizing the starter motor to start cranking the engine;
means responsive to said cranking of the engine for providing an engine speed signal;
start speed sensor means responsive to said speed signal when the engine reaches a start RPM adequate for engine starting for by-passing said start speed timer in order to control said logic means to cause said power control means to maintain energization of the starter motor, said start speed timer operating at the end of said initial time interval to trip said logic means to cause said power control means to deenergize the starter motor if the engine has not reached said start RPM;
run speed sensor means responsive to said speed signal when the engine reaches a run RPM for providing a run lockout signal for tripping said logic means to cause said power control means to deenergize the starter motor;
a crank timer responsive to operation of said start switch for timing a predetermined cranking time interval that does not overheat the starter motor followed by a lockout time interval allowing the starter motor to cool enough preparatory to another cranking cycle and for providing a start lockout signal at the end of said cranking time interval and for terminating said lockout signal at the end of said lockout time interval;
said logic means being tripped responsive to said lockout signal for controlling said power control means to deenergize said starter motor;
and a supply switch responsive to either said run lockout signal or said start lockout signal for supplying operating power from the battery directly to said run speed sensor and said crank timer to maintain them operative in the event said start switch is opened.

4,490,621

METHOD AND APPARATUS FOR GENERATING ELECTRIC POWER BY WAVES

Tomiji Watabe, Noboribetsu; Hideo Kondo, Muroran; Toshihiko Matsuda, Muroran; Kenji Yano, Muroran; Yasuhiko Dote, Muroran, and Matao Takagi, Suita, all of Japan, assignors to Muroran Institute of Technology, Muroran, Japan

Filed Apr. 14, 1983, Ser. No. 485,518
Claims priority, application Japan, Apr. 14, 1982, 57-60869
Int. Cl.³ F03B 13/12
U.S. Cl. 290—42 **7 Claims**



2. In an apparatus for generating electric power by wave force including at least one caisson having a bottom plate, a back plate and sidewalls opening in an opposite side of said back plate and opening at least part of an upper portion of the caisson to form therein a water chamber, said caisson being arranged to form at least part of a breakwater, bank and the like facing to the sea, and a pendulum having a natural period in rocking substantially the same as periods of stationary wave surges of water caused in said water chamber and arranged in said caisson at a distance from said back plate one fourth of lengths of said stationary wave surges which rock said pendulum so as to absorb wave energy to convert it into electric or heat energy, the improvement comprising at least one double acting hydraulic piston and cylinder assembly whose piston is driven by said pendulum to discharge hydraulic liquid in extending and retracting said piston, a change-over valve actuated by pressure difference between cylinder chambers on both sides of said piston of said piston and cylinder assembly, a plurality of hydraulic motors driven by hydraulic liquid controlled by the actuation of said change-over valve to drive a common generator, and accumulators each provided in a line connecting said change-over valve and each said hydraulic motor, thereby generating electric power with the least fluctuation notwithstanding variation in wave force.

4,490,622

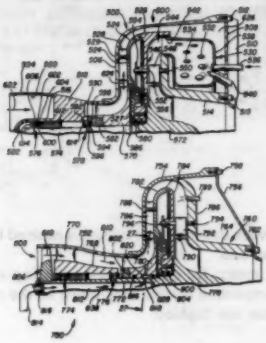
TURBOCHARGER AND ADAPTATIONS THEREOF

Norbert L. Osborn, 402 W. Grauwyler, Irving, Tex. 75061

Division of Ser. No. 38,286, May 11, 1979, abandoned, and a continuation-in-part of Ser. No. 759,773, Jan. 14, 1977, Pat. No. 4,179,247. This application Nov. 15, 1982, Ser. No. 441,726

Int. Cl.³ F02B 37/00

U.S. Cl. 290—52 1 Claim



1. A turbojet comprising:

a housing having a flow channel communicating between a compressor inlet and a turbine exhaust,

a radical flow compressor rotor fitted within said housing for receiving and compressing air from the compressor inlet and for directing compressed air along the flow channel,

a fuel means for introducing fuel with said air flow channel to form an air fuel mixture within said air flow channel,

ignition means within said air flow channel downstream of said compressor rotor for igniting the air fuel mixture to produce combustion gases,

a turbine rotor in driving communication with said compressor rotor and positioned in said housing downstream of said ignition means to receive combusion gases from the air flow channel for driving the turbine and discharging the air through the turbine air exhaust,

a shaft supporting said compressor rotor and said turbine rotor and extending from said compressor rotor and away from said turbine rotor,

bearing support means supported from said housing for rotatively supporting said shaft such that said radial flow compressor rotor and said turbine rotor are positioned to one side of said bearing support means with said bearing support means separated from said turbine by said radical flow compressor,

an armature mounted on said shaft within the air flow channel and on the side of said bearing means opposite said first compressor rotor and said turbine rotor, and

a field winding mounted in the housing adjacent said armature whereby electric current is produced when said armature rotates relative to said field winding.

4,490,623

WIND MOTOR MACHINE

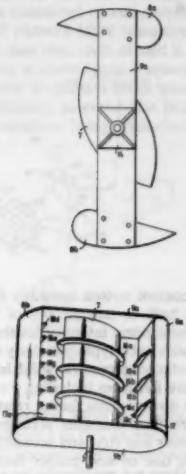
Alfred Goedecke, Pasinger. Str. 27a, D-1000 Berlin 49, Fed. Rep. of Germany

Filed Nov. 10, 1982, Ser. No. 440,580

Int. Cl.³ F03D 3/04

U.S. Cl. 290—55 15 Claims

1. An improved wind motor machine having a wind rotor rotatable about a vertical axis the wind rotor body having a rotor core body with convex curved wind application surfaces and thereto arranged outer load-bearing wing bodies having substantially airplane wing-shaped cross sections, wherein the improvement comprises that in the intermediate space between said rotor core body and said wing body there extends at least



one stream guiding body which is secured to at least one of said wind rotor core body and wing bodies.

4,490,624

DOOR CONTROL APPARATUS

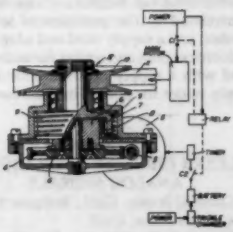
Graham J. Luker, Penshurst, Australia, assignor to The EFCO Manufacturing Company Pty. Ltd., New South Whales, Australia

Filed May 31, 1983, Ser. No. 499,784

Claims priority, application Australia, Jun. 2, 1982, PF4253

Int. Cl.³ H02J 9/06

U.S. Cl. 307—66 6 Claims



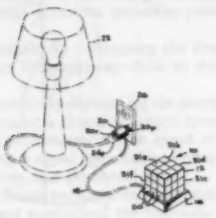
1. Door operating means of the kind comprising an electric motor connectable to a mains power supply and a drive assembly operable by that motor to open and close a door characterised in that said operating means further comprise a second electric motor, an automatic clutch which when engaged, connects the second electric motor to enable it to operate the drive assembly to open the door, a second power supply, and means responsive to interruption of the mains power supply to energise the second electric motor from the second power supply and to engage the clutch.

4,490,625

DIMMER CONTROL SWITCH ASSEMBLY FOR LAMPS AND THE LIKE

David A. Dilly, 812 East Main St., #1, Lexington, Ky. 40502

Filed Aug. 24, 1983, Ser. No. 526,342
Int. Cl.³ H01H 35/00
U.S. Cl. 307—116 12 Claims



1. A dimmer control switch assembly for activating an incandescent lamp bulb to assume any of three different ON states at three illumination intensity levels and an OFF state, comprising a Rubik's cube-type spatial toy activator member in the form of a six-faced geometric solid having a plurality of substantially square flat faces including a control face adapted to be disposed in downwardly facing relation and subdivided into plural square face elements arranged to provide four corner face elements and first and second next-to-corner face elements adjacent one of said corner face elements and displaced toward such corner from the center of said control face, a base unit in the shape of a tray member adapted to rest on a horizontal support surface and having an upwardly opening four corner well bounded by a horizontal base surface and shallow side wall portions to receive the control face and adjacent bottom portions of the Rubik's cube activator member nested therein, said activator member including a pair of magnets incoporated in the first and second face element portions of the activator member, the tray member including electronic circuit means comprising a plurality of magnetically responsive reed switches located immediately below said horizontal base surface in predetermined positions adjacent corners of the well to be closed in selected different combinations correlated to the locations of said magnets for four different dispositions of the Rubik's cube activator member control surface in the well, the electronic circuit means including resistor means and circuitry interconnected with said switches to produce electrical current levels for energizing the lamp at any of said three different intensity levels and at the fourth OFF state correlated to the positions of said Rubik's cube activator member, and a supply cord and adaptor plug member having both electrical plug and socket formations thereon to be interconnected with a supply cord plug for the lamp and an electrical supply outlet for controlling the lamp.

4,490,626

MULTIPLEXER CIRCUITRY FOR HIGH DENSITY ANALOG SIGNALS

Randolph S. Carlson, Irvine, Calif., assignor to Irvine Sensors Corporation, Costa Mesa, Calif.

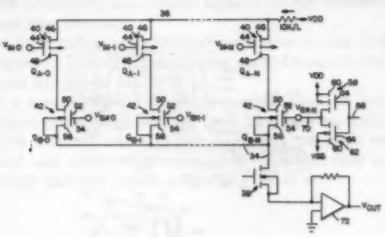
Filed Jul. 29, 1982, Ser. No. 403,004
Int. Cl.³ H03K 17/687
U.S. Cl. 307—243 20 Claims

1. A multiplexer, for use with an array of independent analog voltage signal sources, comprising:

a plurality of separate signal-carrying branches, each having an input from a different analog voltage signal source, and all connected to a common output line, said branches being coupled in parallel between a reference terminal and the common output line;

each branch including an amplifier which causes a high power gain of its analog voltage input when enabled, but which has substantially no power dissipation when disabled, and a respective actuating means for enabling or disabling the individual branch;

the amplifier in each branch being an insulated gate field effect transistor which receives the voltage input signal on its gate and outputs an analog signal as its source-to-drain



current when its respective branch is enabled by its actuating means; and

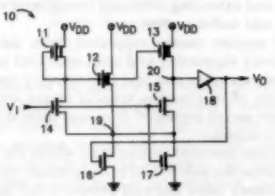
sequencing means for causing each actuating means to enable its respective branch only when all the others in the multiplexer are disabled.

4,490,627

SCHMITT TRIGGER CIRCUIT

Jerry D. Moench, and Frank A. Miller, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 17, 1982, Ser. No. 442,485
Int. Cl.³ H03K 3/295
U.S. Cl. 307—290 6 Claims



1. A Schmitt trigger circuit, comprising:

an input transistor having a control electrode for receiving an input signal, a first current electrode coupled to a control node, and a second current electrode;

a first load device coupled between a first power supply terminal and the second current electrode of the input transistor;

first coupling means for coupling a voltage to the control node;

voltage limiting means for limiting the voltage level at the control node when the input signal is in a first logic state; and

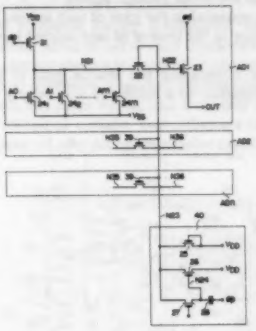
second coupling means for coupling the control node to a second power supply terminal when the input signal is in a second logic state.

4,490,628

MOS DECODER SELECTION CIRCUIT HAVING A BARRIER TRANSISTOR WHOSE NON-CONDUCTION PERIOD IS UNAFFECTED BY SUBSTRATE POTENTIAL DISTURBANCES

Mitsugi Ogura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 22, 1981, Ser. No. 313,994
Claims priority, application Japan, Oct. 29, 1980, 55-150623
Int. Cl.³ H03K *19/003, 19/096, 17/30, 17/687*
U.S. Cl. 307—449 **11 Claims**



1. A semiconductor integrated circuit device comprising:
at least one selection circuit including-
a first node;
first means for periodically pre-charging said first node;
second means for determining the potential state of said first node in response to a state designating signal;
a first MOS transistor connected to said first node and functioning as a barrier;
a second node connected through said barrier of said first MOS transistor to said first node;
third means for providing a signal at a level corresponding to the potential state of said second node; and
a control circuit means for holding the gate potential of said barrier MOS transistor at a low level for a period from the instant when the potential state of said first node is determined until a subsequent pre-charge cycle, including a third node connected to a gate of said barrier MOS transistor, a second MOS transistor connected between said third node and a power source potential terminal and having a gate and a drain connected to each other, a third MOS transistor connected between said third node and said power source potential terminal and having a gate connected to a fourth node, a capacitance element connected to said fourth node, a high-level signal being applied to said capacitance element during the pre-charge cycle, and control means connected to said fourth node, for controlling the potential state of said fourth node.

4,490,629

HIGH VOLTAGE CIRCUITS IN LOW VOLTAGE CMOS PROCESS

Allen R. Barlow, and Corey Petersen, both of Pocatello, Id., assignors to American Microsystems, Inc., Santa Clara, Calif.

Filed May 10, 1982, Ser. No. 376,903
Int. Cl.³ H03K *19/003, 19/094, 19/092, 17/10*
U.S. Cl. 307—451 **17 Claims**

1. A complementary metal oxide silicon push-pull output buffer, comprising:
an input node;
an output node;
a plurality of j P channel MOS transistors, where j is an integer greater than one, each of said j P channel MOS transistors having a control gate, the source of the first P channel MOS transistor being connected to a source of positive voltage V, the drain of the ith P channel MOS transistor being connected to the source of the ith+1 P channel MOS transistor, where i is an integer ranging from 1 to (j−1), and the drain of the jth P channel MOS transistor being connected to said output node;
a plurality of k N channel MOS transistors, where k is an integer greater than one, each of said k N channel MOS transistors having a control gate, a source and a drain, the source of the first N channel MOS transistor being connected to a reference potential, the drain of the Lth N channel MOS transistor being connected to the source of

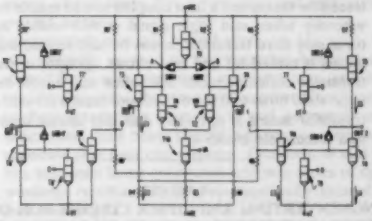
the Lth+1 N channel MOS transistor, where L is an integer ranging from 1 to (k−1), and the drain of said kth N channel MOS transistor being connected to said output node, wherein a set of voltages are applied to the gates of (j−1) of said P channel MOS transistors and to the gates of k−1 of said N channel MOS transistors so as to prevent a voltage in excess of the breakdown voltage from being established on each of said N channel and P channel MOS transistors when turned off, and wherein the remaining N channel and P channel MOS transistors receive control signals on their gates from said input node, said control signals applied to said input node for controlling the state of said output buffer.

4,490,630

CURRENT SWITCH EMITTER FOLLOWER WITH CURRENT MIRROR COUPLED PUSH-PULL OUTPUT STAGE

Leo B. Freeman, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,835
Int. Cl.³ H03K *19/003, 19/086, 17/08*
U.S. Cl. 307—455 **18 Claims**



1. A circuit comprising:
a current switch adapted to receive at least one input and providing true/complement first and second outputs;
a push-pull circuit having first and second inputs and an output, the first input being electrically connected to the first output of said current switch; and
circuit means including an emitter follower and current mirror transistor electrically coupling the second output

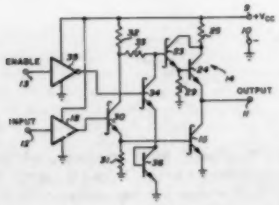
of said current switch to the second input of said push-pull circuit, said current mirror transistor having collector, base and emitter regions with said emitter region connected to a fixed potential and said collector and base regions connected in common and coupled to both the emitter output of said emitter follower and to said second input of said push-pull circuit.

4,490,631

TOTEM POLE/OPEN COLLECTOR SELECTABLE OUTPUT CIRCUIT

David Kung, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 30, 1982, Ser. No. 412,638
Int. Cl.³ H03K *19/088, 19/092, 19/20*
U.S. Cl. 307—456 **6 Claims**



1. A digital driver circuit capable of driving an output terminal in response to an input terminal logic level in either an open transistor collector driver state or in a totem-pole driver state as determined by an enable terminal logic level, said circuit comprising:

first and second supply terminals connectable to a source of operating power;

first transistor means having an emitter coupled to said second terminal, a collector coupled to said output terminal, and a base;

second transistor means having an emitter coupled to said output terminal, a collector coupled to said first supply terminal, and a base;

a two output driver having an input driven from said input terminal and two out of phase output terminals coupled respectively to said base of said first transistor means and to said base of said second transistor means; and

third transistor means having an emitter coupled to said second supply terminal by means of a diode that is forward biased when said third transistor means is rendered conductive, a collector coupled to said base of said second transistor means and a base coupled to said enable terminal whereby when said logic signal at said enable terminal turns said third transistor means on said second transistor means is turned off and said circuit operates in the open transistor collector mode and when said enable terminal logic state turns said third transistor means off said second transistor means is operative and said circuit operates in said totem-pole mode.

4,490,632

NONINVERTING AMPLIFIER CIRCUIT FOR ONE PROPAGATION DELAY COMPLEX LOGIC GATES

Chauncey L. Everett; Theodore W. Houston, both of Richardson, and Henry M. Darley, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 23, 1981, Ser. No. 324,180
Int. Cl.³ H03K *19/017, 19/094, 19/20*
U.S. Cl. 307—475 **15 Claims**

1. A noninverting amplifier circuit for one propogation delay logic gates compatible with depletion mode Schottky barrier field effect transistor inverting amplifier circuits comprising an input interface means for receiving an input voltage signal, said input interface means including:

(a) a first, second and third input interface field effect transistor, each having a gate, source and drain;

(b) a diode;

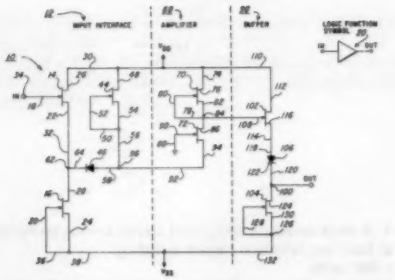
(c) means for connecting a relatively high supply voltage to the drain of said first input interface transistor;

(d) means for connecting the source of said first input interface transistor to the drain of said second input interface transistor;

(e) means for connecting the gate of said first input interface transistor to the input voltage signal;

(f) means for connecting the gate of said second input interface transistor to the source of said second input interface transistor;

(g) means for connecting the source gate of said second interface transistor to a relatively low supply voltage;



(h) means for connecting the relatively high supply voltage to the drain of said third input interface transistor;

(i) means for connecting the gate of said third input interface transistor to the source of said third input interface transistor and to the amplifier means;

(j) means for connecting the anode of said input interface diode to an amplifier means and to the source-gate of said third input interface transistor;

(k) means for connecting the cathode of said input interface diode to the source of said first input interface transistor and the drain of said second input interface transistor of said input interface means; and

(l) amplifier means for providing noninverted amplification of the input voltage signal in one propogation delay; said amplifier means connected to said input interface means including means for receiving the relatively high supply voltage.

4,490,633

TTL TO CMOS INPUT BUFFER

Glenn E. Noufer, Austin, and William J. Donoghue, Round Rock, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 28, 1981, Ser. No. 335,027
Int. Cl.³ H03K *19/003, 19/094*
U.S. Cl. 307—475 **10 Claims**

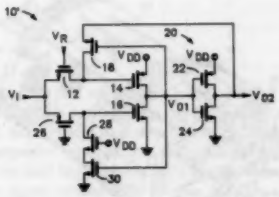
1. A TTL to CMOS input buffer for receiving an input signal having one of the first and second logic states and providing an output corresponding thereto, wherein the first logic state is at or below a first predetermined voltage and the second logic state is at or above a second predetermined voltage, said second predetermined voltage being greater than the first predetermined voltage, comprising:

a first transistor, said first transistor being of a first conductivity type, having a first current electrode coupled to a first power supply terminal, a second current electrode for providing a first output, and a control electrode for receiving the input signal;

a second transistor, said second transistor being of a second conductivity type, having a first current electrode coupled to a second power supply terminal, a second current electrode coupled to the second current electrode of the first transistor, and a control electrode for receiving the input signal;

a third transistor, said third transistor being of the first conductivity type, having a control electrode coupled to the second current electrode of the first transistor, a first current electride coupled to the first power supply terminal, and a second current electrode coupled to the control electrode of the first transistor;

a fourth transistor having a threshold voltage, said fourth transistor being of the second conductivity type, having a first current electrode coupled to the control electrode of the first transistor, a second current electrode coupled to receive the input signal, and a control electrode coupled to a reference voltage, said reference voltage is less than the sum of the second predetermined voltage and the



threshold voltage of the fourth transistor and greater than the sum of the first predetermined voltage and the threshold voltage of the fourth transistor, so that said reference voltage will turn on the fourth transistor when the input signal is in the first logic state and will turn off the fourth transistor when the input signal is in the second logic state;

a fifth transistor, said fifth transistor being of the first conductivity type, interposed between the input signal and the control electrode of the second transistor and having a first current electrode coupled to receive the input signal, a second current electrode coupled to the control electrode of the second transistor, and a control electrode coupled to the second power supply terminal; and

a sixth transistor, said sixth transistor being of the second conductivity type, having a control electrode coupled to the second current electrode of the first transistor, a first current electrode coupled to the second power supply terminal, and a second current electrode coupled to the control electrode of the second transistor.

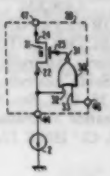
4,490,634

SEMICONDUCTOR CIRCUIT

Kyuichi Hareyama, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Japan

Division of Ser. No. 258,711, Apr. 29, 1981, Pat. No. 4,393,370. This application Mar. 22, 1983, Ser. No. 477,801
Claims priority, application Japan, Apr. 30, 1980, 55-57395
Int. Cl.³ H03K *17/687, 13/02*
U.S. Cl. 307—573 **17 Claims**

10. A current switch circuit for controlling a current supply to a current output terminal in response to first and second control signals, comprising a current source generating a current, a field effect transistor connected between said current output terminal and said current source, and means coupled between a gate of said field effect transistor and a node between said current source and said field effect transistor and responsive to a predetermined combination of logic levels of said first and second control signals for supplying said gate of said first effect transistor with a change in potential opposite to a change in potential at said node, whereby said field effect transistor is activated in response to said predetermined combi-



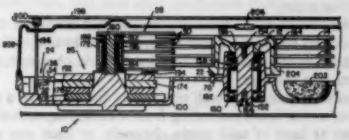
nation of logic levels of said first and second control signals to supply said current to said current output terminal.

4,490,635

PURE TORQUE, LIMITED DISPLACEMENT TRANSDUCER

Joel N. Harrison, Campbell; Donald V. Daniels, Santa Cruz, and David A. Brown, Saratoga, all of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Division of Ser. No. 190,198, Sep. 24, 1980, Pat. No. 4,396,959. This application Nov. 16, 1982, Ser. No. 442,129
Int. Cl.³ H02K *33/00*; G11B *21/08*
U.S. Cl. 310—38 **7 Claims**



1. A brushless, bidirectional, pure torque generating, electromechanical rotary actuator for random access, rapid positioning, along an arc of less than 90 degrees of a data transducer assembly among preselected ones of concentric data tracks of a rotating data storage disk, said actuator comprising:

a base plate,

a lower flux return plate secured to said base plate,

permanent magnet means secured to said lower flux return plate for providing an even number plurality of adjacently opposed field magnetic field segments in which the north and south poles alternate at the major surfaces thereof,

a stationary shaft connected to said base plate and extending vertically perpendicular to said base plate through the center of said lower flux return plate and said permanent magnet means,

a hub rotatably mounted to said shaft,

a coil assembly secured to said rotatable hub and closely spaced from said permanent magnet means, said coil assembly containing the same even number plurality of coils as there are magnet segments in said permanent magnet means, said coils being aligned adjacent to said magnetic segments at at least one position of rotation of said assembly, said coils being connected into two series of opposed windings equidistantly and symmetrically located about said assembly,

an upper flux return plate secured to said base plate parallel to said permanent magnet means defining therebetween an annular space for said coil assembly and closely spaced to said coil assembly,

a data transducer carriage connected to said hub and having a data transducer secured to its distal end, and

a counterweight secured to said hub on the opposite side of said data transducer carriage to balance the weight thereof, whereby energizing said coils causes pure torque to be applied to said hub rotating said rotor arm and

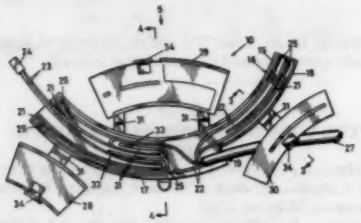
positioning said data transducer relative to said rotating data storage disk.

4,490,636

TERMINAL TRAY FOR RETAINING THE LEADS OF AN ELECTRIC MOTOR

Peter McBratney, St. Marys, Australia, assignor to F. F. Seeley Nominees Pty. Ltd., South Australia, Australia

Filed Aug. 15, 1983, Ser. No. 523,156
Claims priority, application Australia, Aug. 23, 1982, PF5517
Int. Cl.³ H02K 11/00
U.S. Cl. 310—71 9 Claims



1. For use in an electric motor having a stator the improvements comprising a tray of such curved shape as to overlie an end portion of motor stator windings where they are external of stator laminae,

said tray being of polymeric material and having a trough-like cross-sectional shape containing a plurality of spaced webs defining between them lead guide channels spaced from one another,

an access opening in a wall of the tray for access of a plurality of motor leads extending from a cable respectively into some at least of said guide channels, at least one of said leads entering a respective channel by being bent around an end of at least one of said webs for retaining the cable to said tray,

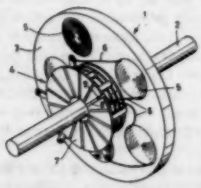
and retaining means for engaging the tray to said motor stator.

4,490,637

ELECTRICAL MACHINE WITH MULTI DISC COMMUTATOR

Jan M. van de Griend, Dordrecht, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 23, 1983, Ser. No. 535,012
Claims priority, application Netherlands, Oct. 18, 1982, 8204002
Int. Cl.³ H01R 39/06; H02K 13/04
U.S. Cl. 310—237 5 Claims



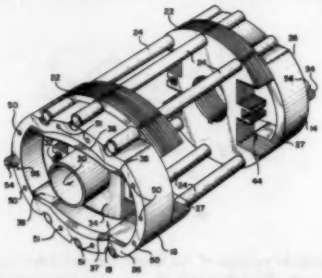
1. An electrical machine comprising a rotor including a plurality of coils, said rotor being provided with a commutator having a commutator disk, said commutator disk having a surface which is provided with segments, one end of each of said coils being connected to a corresponding plurality of said segments, said commutator including an assembly of a plurality of connecting elements which are axially separated by insulation from one another and from said commutator disk, said assembly being disposed axially adjacent said commutator disk, the number of said connecting elements corresponding to the number of coils, an end of each coil being connected to a corresponding one of said connecting elements and said commutator includes lugs for the electrical connection of each of said connecting elements to a plurality of said segments, said lugs bridging an axial separation between said segments and said connecting elements.

4,490,638

SALIENT POLE ROTOR WITH AMORTISSEUR WINDING

LeRoger J. Lind, Minneapolis, Minn., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Aug. 8, 1983, Ser. No. 521,033
Int. Cl.³ H02K 1/24
U.S. Cl. 310—269 15 Claims



1. A conductive rotor end plate assembly for use with a salient-pole dynamoelectric machine, comprising: a first conductive end plate and a second conductive end plate, each defining an axis of rotation; and conductive connecting means for connecting said first conductive end plate to said second conductive end plate such that both conductive end plates are generally centered about said axis of rotation and are generally parallel to each other, said first conductive end plate having at least one notch disposed about its outer periphery to receive said conductive connecting means so as to form an amortisseur winding and having a plurality of balancing apertures located about its plane of rotation at a plurality of radii from said axis of rotation and along two axes generally perpendicular to said axis of rotation.

4,490,639

COUPLING CIRCUIT BETWEEN HIGH IMPEDANCE PIEZOELECTRIC SIGNAL SOURCE AND UTILIZING CIRCUIT

John C. Echols, Ventura, and Charles W. Staufenberg, Santa Barbara, both of Calif., assignors to Essex-Tec Corporation, Carpinteria, Calif.

Filed Sep. 6, 1983, Ser. No. 529,270
Int. Cl.³ H01L 41/08
U.S. Cl. 310—319 6 Claims

5. In combination:

a. a piezoelectric sensor capable of generating slowly changing pyroelectric signals superimposed on more rapidly changing piezoelectric signals;

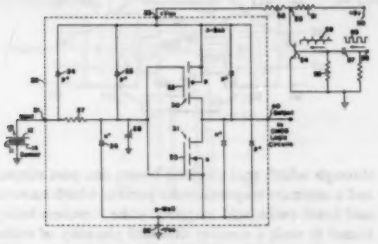
b. an amplifier having a high input impedance and having its input connected to said piezoelectric sensor, said amplifier having plus and minus bias terminals, and said amplifier having voltage clamping means on its input side to prevent the voltage thereat from varying substantially beyond the range of voltage between the limits defined by the voltages of said plus and minus bias terminals;

c. means for supplying bias to said plus and minus bias terminals comprising a source of direct current electrical power and series impedance means connecting said source to said plus and minus bias terminals;

d. switchable load means of low impedance connected in shunt to said means for supplying bias;

e. means for periodically switching said switchable load on to pull down the bias available at said plus and minus bias terminals to substantially zero;

f. and means for alternately switching said load off to permit said bias available at said plus and minus terminals to be



unaffected by said switchable load; whereby the bias for said amplifier is periodically and alternately switched on and off; said voltage clamping means periodically reduces the composite pyroelectric and piezoelectric signal received by said high impedance amplifier from said piezoelectric signal substantially to zero voltage; and

g. the periodicity of switching of said bias on and off being such that the slowly changing pyroelectric signal will not change significantly during any one period while the rapidly varying piezoelectric signal will change enough during one period to cause the voltage clamping means to limit the magnitude thereof.

4,490,640

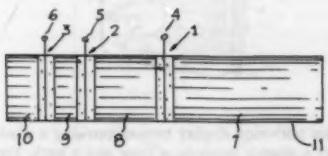
MULTI-FREQUENCY ULTRASONIC TRANSDUCER

Keisuke Honda, 62-1 Aza Shinsanbongi, Shinsanbongi-cho, Toyohashi-shi, Aichi-ken, Japan

Filed Sep. 22, 1983, Ser. No. 534,543

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—325 **6 Claims**



1. A multi-frequency ultrasonic transducer comprising three couples of piezoelectric elements having respective terminals between contact faces thereof, and metal terminals being provided in respective both ends of said three couples of piezoelectric elements, said three couples of piezoelectric elements respectively arranged at the positions of about 0.125, 0.25 and 0.5 from one end in total length thereof, said three couples of piezoelectric elements and said metal terminals being fixed by a bolt which is passed through the center thereof.

4,490,641

THREE ELECTRODE PIEZOELECTRIC CERAMIC RESONATOR

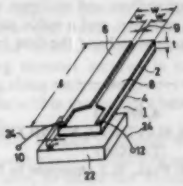
Hiroshi Takeuchi, Matsudo; Shigeru Jyo mura; Kazuyuki Nagatsuma, both of Hachioji; Mitsutaka Hikita; Yukio Ito, both of Kokubunji, and Sakichi Ashida, Fuchu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 29, 1981, Ser. No. 278,729

Claims priority, application Japan, Jun. 27, 1980, 55-86623; Oct. 17, 1980, 144388

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—366 **16 Claims**



1. A piezoelectric resonator resonating at a resonant frequency greater than 1 MHz comprising: a piezoelectric ceramic plate which is polarized in the same direction in the direction of thickness thereof, electrodes formed on the two opposing main surfaces of said piezoelectric ceramic plate, said electrode formed on one main surface being divided into two split electrodes, and said split electrodes receiving a signal for causing said piezoelectric ceramic plate to resonate beneath said split electrodes in a thickness dilatational mode with a phase difference of 180° at a resonant frequency greater than 1 MHz.

4,490,642

HIGH-PRESSURE SODIUM DISCHARGE LAMP

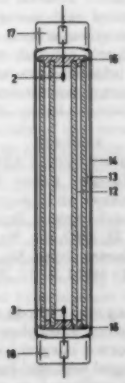
Alexander Dobrusskin, Taufkirchen, and Georg Marsen, Ottobrunn, both of Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Filed Jul. 12, 1982, Ser. No. 397,186

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129329

Int. Cl.³ H01J *61/30, 61/34, 61/12, 5/12*

U.S. Cl. 313—25 **19 Claims**



1. Sodium high-pressure discharge lamp having

a discharge vessel (1, 12, 22) made of a material resistant to sodium;

discharge electrodes (2, 3) positioned at spaced locations within the discharge vessel;

and an envelope system surrounding the discharge vessel,

wherein, in accordance with the invention, the envelope system comprises

a first, inner envelope element (4, 13, 21) closely adjacent and surrounding the discharge vessel, and a second, outer envelope element (5, 14, 20) surrounding the first, inner envelope element, and spaced therefrom; and

a fill of at least one of the materials of the group consisting of: entirely nitrogen; a mixture of nitrogen and a noble gas; entirely a noble gas; sodium and nitrogen; sodium and a noble gas; sodium, nitrogen, and a noble gas in the space between the discharge vessel and the first, inner envelope element.

4,490,643

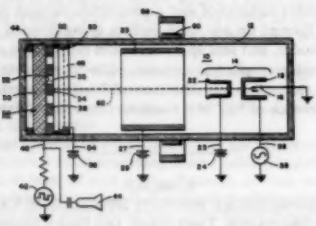
STORAGE DEVICE HAVING A SEMICONDUCTOR TARGET

Robert S. Silver, Kendall Park, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 789,762, Jan. 8, 1969, abandoned. This application May 19, 1971, Ser. No. 145,002

Int. Cl.³ H01J *31/58*

U.S. Cl. 313—391 **23 Claims**



1. An electron device having information storage capabilities, comprising:

a. an evacuated envelope;

b. a storage target disposed within said envelope comprising semiconducting regions and storage regions alternating across an exposed major face of said target, said semiconducting regions being surface portions of a continuous layer of semiconductor material of substantially single conductivity type and said storage regions consisting essentially of a discontinuous layer of an insulating compound of semiconductor material; and

c. means for writing information on said storage target, for reading said information, and for erasing said information.

4,490,644

MAGNETIC FOCUSING TYPE CATHODE RAY TUBE

Taketoshi Shimoma, Isezaki; Kumio Fukuda, and Toshio Shimaoogi, both of Fukaya, all of Japan, assignors to Tokyo Shibaura Denki Kobashiki Kaisha, Japan

Filed Aug. 25, 1982, Ser. No. 411,360

Claims priority, application Japan, Sep. 2, 1981, 56-137002

Int. Cl.³ H01J *29/51, 29/64*

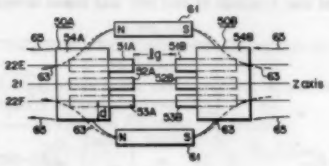
U.S. Cl. 313—413 **6 Claims**

1. A magnetic focusing type cathode ray tube comprising:

a glass envelope including a faceplate on which a screen is formed, a funnel portion integral with said faceplate, and a neck portion integral with said funnel portion;

electron gun means positioned in said neck portion to project a plurality of electron beams toward said screen along beam paths substantially parallel to said neck portion, said plurality of electron beams being positioned in line; and

magnetic focusing means positioned in front of said electron gun means along the beam paths within the neck portion, and including permanent magnet means for generating a focusing magnetic field and a magnetic yoke assembly having at least first and second magnetic yoke members, each of said first and second magnetic yoke members having a plurality of cylindrical magnetic yoke portions



through which said electron beams can pass respectively and a common magnetic yoke portion which surrounds all said beam paths, said magnetic yoke members being positioned in such a manner that said plurality of cylindrical magnetic yoke portions of the first magnetic yoke member are spaced from that of the second magnetic yoke member at a given distance along the beam paths, and each of the common magnetic yoke portions of said first and second magnetic yoke members reducing the strength of a radial magnetic field component of said focusing magnetic field.

4,490,645

COLOR TELEVISION DISPLAY TUBE

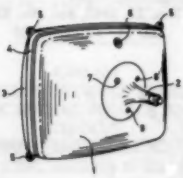
Robert Hamersma, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 111,615, Jan. 14, 1980, abandoned. This application Nov. 15, 1982, Ser. No. 441,710

Claims priority, application Netherlands, Feb. 26, 1979, 7901481

Int. Cl.³ H01J *29/70;* **H04N** *5/645;* **C03C** *3/22;* **C03B** *11/00*

U.S. Cl. 313—440 **3 Claims**



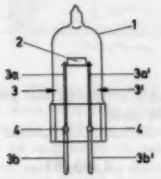
1. A color television display tube comprising a glass envelope having a display window, a cone and a neck, the outer surface of said cone having a number of abutments for positioning a system of deflection coils on the envelope, characterized in that said abutments comprise separately molded, thermally devitrified glass ceramic studs attached to the envelope, each stud being formed by mixing powdered devitrifiable glass with an organic binder, compressing the mixture in a mold to a desired shape having predefined dimensions, and heating the mixture to effect devitrification, the coefficient of expansion of the glass studs being substantially the same as the coefficient of expansion of the envelope.

4,490,646

HALOGEN CYCLE INCANDESCENT LAMP HAVING AN INTERMEDIATE LEAD-IN CONDUCTOR PART

Axel Bunk, Ingolstadt, and Karl Stadler, Pietenfeld, both of Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,636
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125192
Int. Cl.³ H01K *1/20, 1/40*
U.S. Cl. 313—579 10 Claims



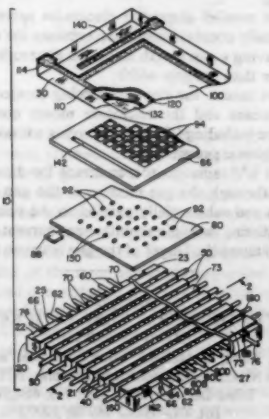
1. Halogen cycle incandescent lamp having
a lamp bulb (1) of quartz glass or hard glass including a stem press (5) closing the lamp bulb;
multi-part lead-in wires (3, 3') having a first part (3*b*, 3*b'*) leading from outside the bulb into the press, and a second part (3*a*, 3*a'*) leading from the press into the inside of the bulb, said lead-in wires being of different diameter and comprising molybdenum or tungsten,
and wherein, in accordance with the invention,
an intermediate part (4) of nickel is provided, positioned between and joining together the respective parts of the lead-in wires, a portion of the first and second parts of the wires and the intermediate part of nickel (4) being located within the zone of the press (5) of the lamp.

4,490,647

GAS-FILLED DOT MATRIX DISPLAY PANEL

Nicholas C. Andreadakis, Branchburg, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 29, 1982, Ser. No. 445,209
Int. Cl.³ H01J *17/49*; G09G *3/28*
U.S. Cl. 313—586 6 Claims



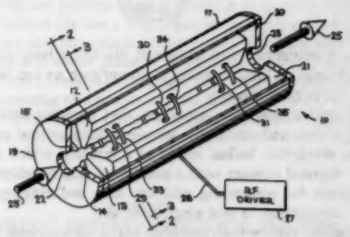
1. A gas-filled display panel comprising
a glass base plate and a glass face plate hermetically sealed together to form an envelope which is filled with an ionizable gas,
the seal area between said base plate and face plate extending around the perimeters of said base plate and face plate,
said base plate having an array of longitudinal slots in which anode wires are seated,
said base plate also having cross grooves transverse to said slots and positioned one near each end of the base plate, each cross groove being deeper than said slots,
an electrode in each of said cross grooves adjacent to the base thereof, said seal area covering portions of said cross grooves at the periphery of the panel,
an array of cathode electrodes disposed adjacent to and transverse to said anode electrodes and forming an array of rows and columns of gas cells therewith, and
an insulating member secured in each cross groove and extending along each cross groove so that the ends of each member lie within the seal area between the base plate and face plate,
the top surface of each insulating member being generally coplanar with the top surface of said base plate, at least in said seal area, to insure the formation of a hermetic seal between said base plate and face plate at said cross grooves.

4,490,648

STABILIZED RADIO FREQUENCY QUADRUPOLE

Henry D. Lancaster, Orinda; Jack A. Fugitt, Berkeley, and Donald R. Howard, Danville, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 29, 1982, Ser. No. 426,363
Int. Cl.³ H01J *25/10*
U.S. Cl. 315—5.41 7 Claims



1. A stabilized radio frequency quadrupole resonator of the long-vane type for simultaneously bunching, focusing and accelerating charged particles along a linear central path through said resonator, comprising:
means defining a radio frequency resonator cavity;
four radially equally spaced vanes elongated and continuous in the axial direction of said means, said vanes having a base end and a tip end, said base end being mounted on said defining means and extending therefrom for dividing said cavity into four equal sections to form the two pairs of opposing vanes; and
means electrically interconnecting opposing ones of said plurality of vanes at substantially the same longitudinal axial point along said central path for stabilizing said resonator, said interconnecting means enabling said resonator to be tuned by adjustment of any one of said vanes to affect the resonant frequency, said interconnecting means eliminating undesirable dipole modes from the resonant frequency;
wherein said interconnecting means between opposing vanes electrically interconnects the tip ends of opposing vanes, said interconnecting means extending from opposing vanes through adjacent sections and holes in adjacent elongated vanes; and

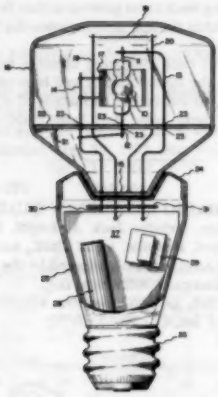
wherein said interconnecting means includes at least one pair of full-ring segments.

4,490,649

THERMAL BAFFLE INSIDE A DISCHARGE LAMP

Hsin-Pang Wang, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 20, 1982, Ser. No. 435,520
Int. Cl.³ H01J 7/44, 13/46, 19/78, 29/96
U.S. Cl. 315—50 4 Claims



1. A universal position electric discharge lamp comprising:
a source of visible radiation comprising an arc tube having electrodes therein;
a light-transmissive envelope that encloses said radiation source and contains a gas supporting natural convection;
an electronic ballast inside of a housing which is in good thermal contact with a portion of said envelope;
means for supporting said arc tube and making electrical connection to said electrodes; and
thermal convection/radiation baffle means inside said envelope between said arc tube, which is a source of heat, and said ballast housing to reduce the ballast temperature and prolong the lifetime of said lamp;
said baffle means including a continuous transparent glass wafer which extends from side wall to side wall of said envelope and has an infrared-reflecting coating that is transmissive to visible light.

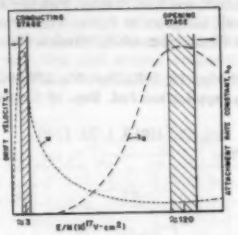
4,490,650

GAS MIXTURE FOR DIFFUSE-DISCHARGE SWITCH

Loucas G. Christophorou, Oak Ridge; James G. Carter, Knoxville, and Scott R. Hunter, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 31, 1982, Ser. No. 413,588
Int. Cl.³ H05B 37/02
U.S. Cl. 315—150 4 Claims

1. An inductive energy storage system comprising:
a diffuse-discharge switch;
a binary gas mixture in said diffuse-discharge switch comprising Ar and a compound selected from the group consisting of C_2F_6, C_3F_8, n-C_4F_{10}, WF_6, and $(CF_3)_2O$; and



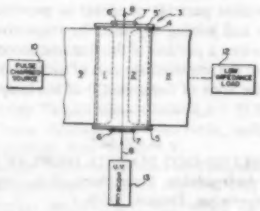
means for selectively activating said gas mixture to an electrical conductive state.

4,490,651

LASER TRIGGERED HIGH VOLTAGE RAIL GAP SWITCH

Roderick S. Taylor, Ottawa; Kurt E. Leopold, Carp, and A. John Alcock, Ottawa, all of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Continuation of Ser. No. 262,685, May 11, 1981, Pat. No. 4,401,920. This application Dec. 7, 1982, Ser. No. 447,674
Claims priority, application Canada, May 23, 1980, 353041
Int. Cl.³ H05G 37/02
U.S. Cl. 315—150 8 Claims



1. A high voltage rail gap switch for a pulse charged source comprising:
a pair of parallel elongated electrodes spaced to form an essentially constant width gap between the electrodes, the gap having a gap length along the electrodes substantially greater than the gap width;
enclosure means, the electrodes being located in the enclosure means and the enclosure means containing a gas mixture including SF_6 and Ar having a total presure above atmospheric pressure; and
coherent UV radiation source means for directing a pulsed beam through the gas mixture in the gap along the gap length and substantially parallel to the pair of electrodes for initiating multiple simultaneous current sharing breakdowns along the length of the gap between the electrodes.

4,490,652

FLAT CATHODE RAY TUBE WITH KEYSTONE COMPENSATION

Vernon D. Beck, Ridgefield, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,765
Int. Cl.³ H01J 29/70, 29/72
U.S. Cl. 315—366 8 Claims

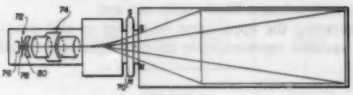
1. A flat cathode ray tube of the type in which the electron beam travels in a path parallel to the screen, having reduced

keystone distortion, said tube having a long direction, and comprising:

an envelope having a long direction and a screen disposed therealong;

means for emitting an electron beam and directing it towards said screen;

main deflecting means disposed along the long direction of the tube for deflecting said emitted electron beam in mutually perpendicular directions;



means disposed along the long direction of the tube in the proximity of said main deflecting means for generating a substantially hexapole field for introducing corrective deflective forces to said beam to compensate for said keystone distortion, said means for introducing said forces bounding a cross-sectional area in a plane which is normal to the plane of said screen; and

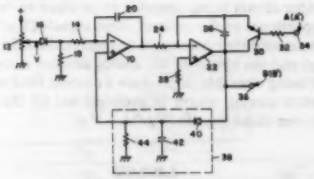
said corrective deflective forces introduced being in opposing directions in successive quadrants of said cross-sectional area.

4,490,653

DEFLECTION SYSTEMS AND RAMP GENERATORS THEREFOR

Harold W. Olmstead, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 6, 1982, Ser. No. 366,014
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—403 **18 Claims**



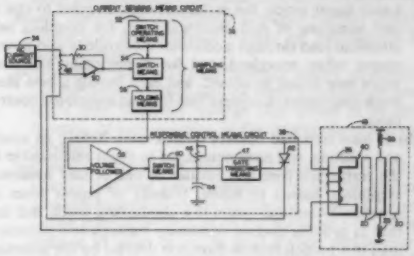
1. A ramp generator comprising an integrating capacitor, current source means, connected to the capacitor to charge the capacitor and thereby generate a ramp signal, a switching device connected to said capacitor and having a control terminal and operative to discharge said capacitor periodically in response to a periodic control signal applied to said control terminal, a peak detector connected to the capacitor for detecting the peak value of the ramp signal, a comparator having a first input terminal connected to the peak detector and a second input terminal for application of a reference voltage to the comparator, said comparator being operative to compare said peak value and said reference voltage and being connected to said current source means to control the rate of supply of current to the capacitor in response to the comparison result so as to maintain a predetermined relationship between the amplitude of the ramp signal and said reference voltage, independently of the frequency of the control signal.

4,490,654

CONTROL CIRCUIT FOR VIBRATORY DEVICES

Gerald L. Buchas, Bristol, Conn., assignor to The Arthur G. Russell Company, Incorporated, Bristol, Conn.

Filed Jun. 10, 1983, Ser. No. 503,028
Int. Cl.³ H02K *33/02*
U.S. Cl. 318—130 **10 Claims**



1. A vibratory amplitude controller for a vibratory mechanism having a parts supporting member, an electromagnetic drive unit having an iron core coil and an armature for imparting oscillatory motion to the parts supporting member, and an A.C. current source for powering the electromagnetic drive unit, said controller comprising:

sensing means for sampling the electromagnetic drive unit current during a specific predetermined interval each A.C. current cycle;

means responsive to said sample current for controlling the amount of A.C. power supplied by the current source to said electromagnetic drive unit;

said current of said electromagnetic drive unit exhibiting a dip during one portion of each of said A.C. current cycles which current dip has a magnitude inversely proportional to the physical gap existing between the armature and the iron core coil at the point of armature movement closest to said iron core coil during said A.C. current cycle, and

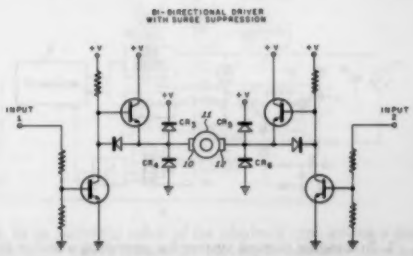
means for causing said predetermined interval of said sensing means during which current sampling occurs to coincide with the time said dip occurs in each cycle of said A.C. current.

4,490,655

BI-DIRECTIONAL DRIVER SYSTEM FOR ELECTRICAL LOAD

Alan S. Feldman, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Sep. 27, 1982, Ser. No. 425,012
Int. Cl.³ H02P *1/22*
U.S. Cl. 318—294 **10 Claims**



9. A bi-directional driver circuit for an electrical load having a first terminal and a second terminal, having two independent

command inputs, operable from a power source supplying power between the system and ground so as to energize said load in a predetermined polarity in response to a first command signal applied to a first input, and in an opposing polarity in response to a second command signal applied to a second input, and for inhibiting operation when said first and second command signals are coincidentally but not necessarily simultaneously applied to their respective inputs, comprising:

(a) at least two transistor amplifiers, operating in emitter-follower linear mode, the emitter of each coupled to one of said terminals of said electrical load, for coupling said electrical load through a collector electrode to said power source when energized, and for deenergizing said load when base biased to cut-off, and each having a base electrode responsive to control bias from an associated control diode,

(b) at least two said control diodes, each having an anode and cathode, and each connected in shunt relationship to the respective base and emitter of one of said transistor amplifiers, biased to inhibit transfer of power from its associated amplifier when in a conducting mode and further to provide current continuity through said electrical load in a predetermined direction defined by the polarization of such diodes and an applied input digital command signal,

(c) at least two transistor switches, operating in grounded-emitter saturated mode, each associated with one of said control diodes, and each coupled between the cathode of said associated diode and ground, and each having a base electrode responsive to signal bias, and

(d) at least two bias network means, each coupled to one of said transistor switch base electrodes for biasing each of said transistor switches respectively, and responsive to independent input digital signal command means,

whereby said electrical load is energized in said predetermined polarity when only said first input command is applied to said first bias network means, to said opposing polarity when only said second input command is applied to said second bias network means, and deenergized when both said first and second commands are applied to their respective inputs, wherein said load is inductive, and further comprising:

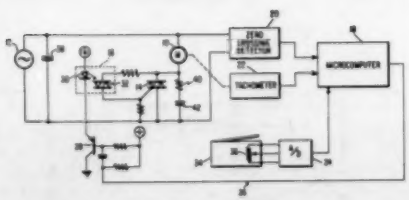
a plurality of unidirectional conducting means, coupled between each of said inductive load first and second terminals and said power source and ground respectively, biased to be nonconducting during energization of said load, for suppressing inductive transient surges when said load is deenergized or reversed in polarity.

4,490,656

OVERLOAD PROTECTION IN A MOTOR CONTROL SYSTEM

Bruce E. Arnold, Clinton, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jun. 30, 1983, Ser. No. 509,482
Int. Cl.³ H02K 23/68; H02P 7/00
U.S. Cl. 318—434 **1 Claim**



1. In a motor control system for operating a motor from a cyclically varying power supply at preselected speeds including a phase control circuit connected between said motor and said power supply, and a firing circuit coupled to said phase control circuit for phase firing said phase control circuit to supply power to said motor during a portion of the cycle of said power supply, a method for preventing overload of said motor comprising the steps of:

(a) providing an electrical representation of a variable;

(b) examining the magnitude of the cycle portion repetitively at a fixed, regular, time interval; and

(b1) increasing said variable representation when said cycle portion exceeds a predetermined threshold; or

(b2) decreasing said variable representation when said cycle portion does not exceed said predetermined threshold, said variable representation being incapable of being decreased below a fixed minimum; and

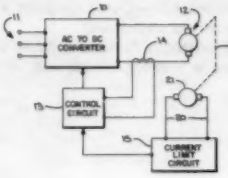
(c) preventing the application of power to said motor when said variable representation reaches a predetermined value.

4,490,657

AUTOMATIC TORQUE TAPER CIRCUIT

Enoch P. Smith, Greendale, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Oct. 11, 1983, Ser. No. 540,529
Int. Cl.³ H02P 5/06
U.S. Cl. 318—434 **4 Claims**



1. In a motor drive system which includes a control circuit that produces a current command signal to a converter that controls the magnitude of the current applied to a motor, the improvement therein comprising:

means coupled to the motor for producing a signal (V_s) proportional to motor speed;

means for producing a reference signal (V_R);

an analog divider circuit having a divisor input connected to receive the speed signal (V_s) and a dividend input connected to receive the reference signal (V_R), the analog divider circuit being operable to produce an output signal proportional to the ratio of these signals (V_R/V_s); and

an output amplifier connected to receive the reference signal (V_R) and the output of the analog divider circuit (V_R/V_s) and being operable to produce a current limit signal to the control circuit which is proportional to the difference between these signals ($V_R/V_s - V_R$).

4,490,658

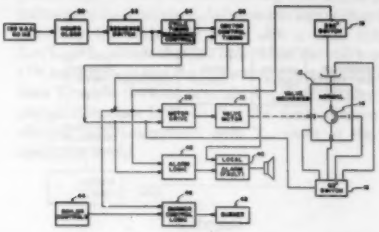
CIRCUIT FOR AUTOMATICALLY SEQUENCING A VALVE MECHANISM

Robert S. John, Deerfield, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,969
Int. Cl.³ G05B 11/18
U.S. Cl. 318—484 **5 Claims**

1. A circuit for controlling the operation of a rotatable valve mechanism through a sequence of cycled operations at selectable time intervals, comprising motor means for rotating said valve mechanism unidirectionally through successive cycles, and in which a sequence is comprised of rotation of the valve mechanism through arcs of predetermined extent from a normal position to successive intermediate positions and back to said normal position to complete a valve mechanism operating sequence, and in which each cycle comprises rotation of the valve mechanism from one position to the next in said sequence, first means operative on rotation of the valve mechanism away from the normal position for producing a lockout

signal to operate a first output switch, said circuit including means for terminating the rotation of said valve mechanism at each position to terminate each cycle, means operative with the mechanism at an intermediate position for holding said mechanism at that intermediate position for a predetermined timed period, means responsive to the end of said timed period for energizing the motor means to rotate the valve mechanism to the next successive position, and means responsive to the valve mechanism reaching the next position for continuing said



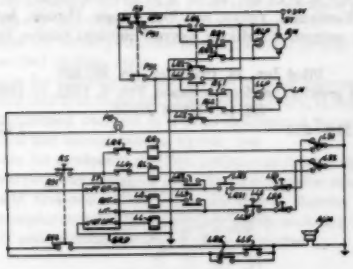
cycles of the mechanism until return of the mechanism to its normal position whereby to terminate said lockout signal and to restore said first output switch and end said sequence, in which said positions are disposed at 90° of arc from one another, and in which there is means for producing a signal whenever said valve mechanism is not in one of said positions, and in which there are alarm means operative whenever said valve mechanism is in its normal position and either of said signals is still being produced.

4,490,659

VOLTAGE CONTROLLED, VARIABLE TIME DELAY ELECTRONIC INTERVAL TIMER FOR MOTOR CONTROL

James E. Hansen, Oak Creek, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 11, 1983, Ser. No. 540,738
Int. Cl.³ G05D *3/10*; G01C *21/18*; H01H *43/00*
U.S. Cl. 318—484 **9 Claims**



1. In a motor control system having at least one motor for driving a load device accurately and consistently a predetermined distance, the improvement comprising:

an electrical supply source supplying operating voltage to the motor and having a voltage magnitude subject to variation so as to vary the motor speed;

output control means supplied from said source for energizing the motor;

an interval timer supplied from said source for controlling said output control means for a time interval that has a variable length inversely proportional to said variation in the magnitude of the supply voltage;

control means for initiating operation of said timer;

means responsive to said timer upon initiation of operation thereof for controlling said output control means to energize the motor so as to start driving the load device;

said interval timer comprising:

means comprising a voltage regulator supplied from said source and responsive to initiation of operation of said timer for providing a constant reference voltage;

means comprising a precision constant current circuit responsive to said reference voltage for providing a linear ramp voltage;

means comprising a voltage inverter circuit responsive to said reference voltage and the supply voltage for providing a time reference voltage that varies as an inverse function of said variation in the magnitude of the supply voltage;

and means comprising a comparator responsive to said ramp voltage and said time reference voltage for controlling said output control means to stop the motor at the end of a time interval dependent on the magnitude of the supply voltage so as to drive the load device consistently and accurately the same distance each time regardless of any variation in the supply voltage.

6. An interval timer comprising:

a direct current power supply source;

means supplied from said source for providing a controlled reference voltage;

a voltage ramp generator comprising a precision circuit responsive to said reference voltage for providing a constant current and a capacitor network responsive to said constant current for providing a linear ramp voltage;

time reference means comprising adjustable means controlled by said source and said reference voltage for providing an adjustable time reference voltage;

comparator means responsive to said time reference voltage for providing an output signal to initiate a time interval and being responsive to said linear ramp voltage reaching and exceeding said time reference voltage for terminating said output signal to terminate said time interval;

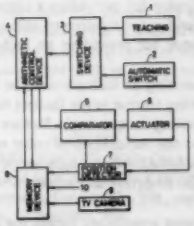
and adjustment of said adjustable means effecting corresponding adjustment of said time reference voltage thereby to adjust the length of said time interval.

4,490,660

SAFETY SYSTEM AND METHOD FOR A ROBOT

Akira Tsuchihashi, Nagareyama, Japan, assignor to Hitachi, Ltd., Toyko, Japan

Filed Jun. 7, 1983, Ser. No. 501,993
Claims priority, application Japan, Jun. 7, 1982, 57-96257
Int. Cl.³ G05B *23/02*
U.S. Cl. 318—565 **20 Claims**



1. In an industrial robot of the playback type having a position control object portion for moving to successive positions in accordance with successive steps as taught in a teaching mode, a safety system comprising detecting means having a detecting field of view containing at least a part of the robot and providing detection data indicative of the detected field of view, memory means for storing detection data of the detect-

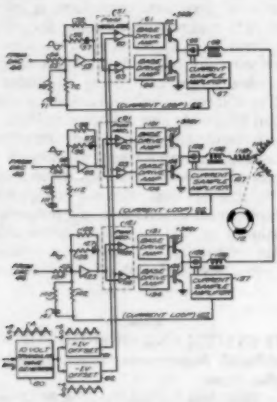
ing means at least in selected ones of the successive positions corresponding to the successive steps in the teaching mode, means for reading, at least in selected steps of the playback operation, the detection data of a corresponding step from the memory means and for comparing the read-out detection data with present detection data from the detecting means obtained in the present step during the playback operation, and means responsive to the comparing means for controlling further movement of the robot.

4,490,661

CONTROL SYSTEM FOR SYNCHRONOUS BRUSHLESS MOTORS UTILIZING TORQUE ANGLE CONTROL

Lynnie B. Brown, Roanoke; Charles J. Ford, III, and Richard F. Dugan, both of Blacksburg, all of Va., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Jul. 28, 1983, Ser. No. 518,130
Int. Cl.³ G05B 1/06
U.S. Cl. 318—661 5 Claims



1. A motor control system for a brushless DC motor comprising:

a motor including stator windings and a rotor;

a position indicator for providing a signal indicative of the position of said rotor relative to said stator;

a speed indicator for providing an indication of the rotor speed;

means for generating an indication of the load on said motor;

a memory having torque angle factors recorded therein;

means for selecting torque angle factors from said memory according to the indications of rotor speed and load, and adding the selected torque angle factor to the indication of rotor position to derive an excitation vector position indication; and

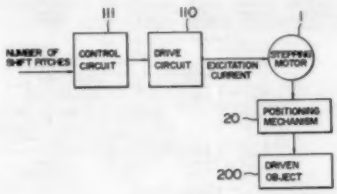
excitation current generating means for applying sinusoidal excitation currents to said windings, the excitation currents having controllable phases and having values created incrementally from pre-recorded digital sine values selected in accordance with the excitation vector position indications from said means for selecting torque angle factors and the position indications from said position sensor, such that the torque angle is adaptively controlled as a function of speed and load.

4,490,662

POSITIONING METHOD AND APPARATUS THEREFOR

Yoshihiro Moribe, Chigasaki; Yukitaka Hayashi, and Masahiro Mitamura, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 27, 1983, Ser. No. 517,813
Claims priority, application Japan, Sep. 3, 1982, 57-152723; Sep. 3, 1982, 57-152724
Int. Cl.³ H02K 29/04
U.S. Cl. 318—685 22 Claims



1. A positioning method for a positioning apparatus including a stepping motor having a plurality of rotary poles mounted on a rotatable motor shaft, a plurality of stationary poles, and a plurality of stationary pole windings arranged around said rotary poles, said motor shaft being rotated stepwise each time said stationary pole windings are supplied with pulse currents, a translation means for translating a rotary movement of said motor shaft of said stepping motor to a linear movement, and a driven object adapted to be moved by a predetermined number of pitches by the linear movement of said translation means, the method comprising the steps of:

multiplying the number of pitches required for positioning said driven object to a desired position by an integral multiple of the number of said stationary poles windings of said stepping motor to calculate a number of pulses for driving said stepping motor; and

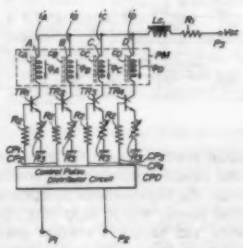
applying the calculated number of pulses to said stepping motor to position said driven object to the desired position.

4,490,663

DEVICE FOR DRIVING A STEPPING MOTOR

Shuichi Kamiyama, Tokyo, and Yoji Okada, Hitachi, both of Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1982, Ser. No. 392,889
Claims priority, application Japan, Feb. 8, 1982, 57-18548
Int. Cl.³ H02K 29/04
U.S. Cl. 318—696 2 Claims



1. A circuit for driving a stepping motor, comprising:

a power supply source,

a plurality of phase coils, each having a respective inductance L_m,

a switching transistor connected to each said phase coil, each said transistor having an emitter and a control electrode,

a regulatory resistor having a resistance R_e connected to the emitter of each said switching transistor,

a pulse distributing circuit connected to supply ON and OFF signals to the control electrodes of the switching transistors, said pulse distributing circuit having a pulse period T_p,

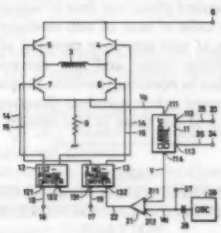
current holding means connecting the phase coils to said power supply source and comprising a resistance R and an inductance L_c in series, L_c being much larger than L_m, and provding for each said phase coil a total inductance $L=L_m+L_c$ which changes little when the coil is switched ON and OFF, so that the coil's time constant L/R is larger than T_p while the time constant L_m/R_c is smaller than T_p and smaller than L/R, so that the time constant L/R is always larger compared with T_p, even at the highest operating speed.

4,490,664

STEP MOTOR EXCITING APPARATUS

Fujio Moriguchi, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1982, Ser. No. 435,448
Claims priority, application Japan, Oct. 20, 1981, 56-166297
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **10 Claims**



1. An apparatus for exciting a step motor having at least first and second phase exciting coils, comprising:

means for sensing currents flowing in each of said first and second exciting coils;

means for applying first and second exciting currents to said first and second exciting coils, respectively, in response to the sensed currents in a ratio determined by respective first and second control signals; and

means for producing said first and second control signals for varying said ratio in a plurality of successive equal steps, said first and second exciting currents thereby varying complementarily in a staircase fashion such that the total of said exciting currents remains a constant.

4,490,665

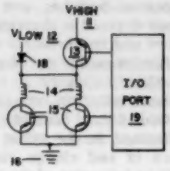
METHOD FOR DRIVING A STEPPER MOTOR

Richard C. Meyer, LaHabra, and Peter Kan, Fullerton, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 26, 1983, Ser. No. 517,487
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **4 Claims**

1. A method for driving a stepper motor wherein at least some steps of the motor rotation each comprise:

supplying a first voltage to the motor for a time period, such time period being selected as a function of the required speed of the motor; and



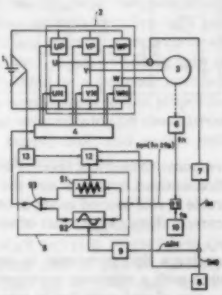
supplying a second lower voltage to the motor for the remainder of the motor step after the time period ends.

4,490,666

CONTROL OF INDUCTION MOTOR USING PWM INVERTER

Tokunosuke Tanamachi; Hiroshi Narita; Masahiko Ibamoto, and Shigetoshi Okamatsu, all of Katsuta., Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 10, 1982, Ser. No. 406,788
Claims priority, application Japan, Aug. 21, 1981, 56-131740
Int. Cl.³ H02P *7/42*
U.S. Cl. 318—800 **20 Claims**



1. A control device comprising an inverter for converting direct current from a DC supply to alternating current and for feeding converted alternating current to an induction motor, a pulse-width modulation controlling device containing a means for sequentially changing the number of pulses in a half cycle of the output voltage of the inverter so as to control the output voltage and output frequency of the inverter in relation to the rotational speed of the induction motor, and means for adjusting a reference value related to the rotational speed for changing said number of pulses in the half cycle of the output voltage of the inverter in accordance with an output voltage of the DC supply.

4,490,667

SYSTEM AND CIRCUIT FOR CHARGING A RECHARGEABLE BATTERY

Ferdinand H. Mullersman, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Aug. 31, 1982, Ser. No. 413,583
Int. Cl.³ H02J *7/04*
U.S. Cl. 320—48 **6 Claims**

1. An electrical circuit for charging a rechargeable cell comprising:

current input receiving means adapted to be connected to an external source of direct current;

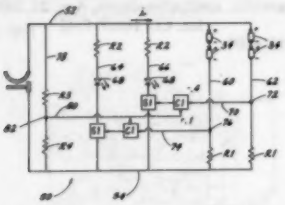
a pair of first current branches, each branch in said pair

adapted to receive at least one rechargeable cell and in electrically parallel relationship with the other branch in said pair;

a pair of second current branches, one of said second branches in said pair disposed in electrically parallel relationship with one of said first branches and the other of said second branches disposed in electrically parallel relationship with the other first branch;

a pair of charge current indicators, one of said indicators disposed in one of said second branches and the other of said indicators disposed in the other of said second branches and each of said charge current indicators adapted to provide an indication of the passage of a first predetermined level of charge current through one of said first current branches;

a pair of switches, one of said switches disposed in one of said second current branches and the other of said switches disposed in the other of said second current branches, each of said switches operable in a first mode to prevent the flow of current through its respective second current branch and operable in a second mode to permit the flow of current through its respective second current branch, one of said pair of switches operable in said second mode in response to said first level of current through one of said first current branches and the other of said switches operable in said second mode in response to said first level of current through the other of said first current branches;



means for comparing a first parameter in one of said first current branches with a reference parameter and providing a signal to one of said switches in response to a first predetermined difference between said parameters, said one of said switches operative in said second mode in response to said signal to permit the flow of current through its respective second current branch and permit one of said charge current indicators to provide an indication of the passage of charge current through said one of said first current branches, said first predetermined difference being selected so as to preclude said comparing means from providing said signal when said current input receiving means is disconnected from said external source of current and a circulating current is circulating in said circuit as a result of a difference in the state of charge of the rechargeable cell in one of said first current branches from the state of charge of the rechargeable cell in the other of said current branches.

4,490,668

MICROWAVE RADIATOR UTILIZING SOLAR ENERGY

Fred Sterzer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 12, 1979, Ser. No. 57,109

Int. Cl.³ H02M 7/00

U.S. Cl. 322—2 R **6 Claims**

1. A space-oriented apparatus for converting solar electromagnetic energy to microwave radiation, said apparatus comprising:

source means for generating microwave radio frequency (RF) signals;

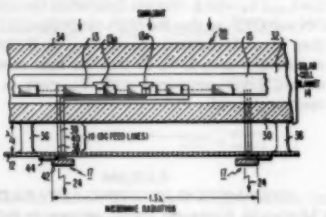
a plurality of energy converting modules formed as an array on a support structure, each module comprising:

a plurality of solar cells arranged in a group to form an array to generate direct current power;

microwave signal amplifying means coupled to said source means and being responsive to said RF signals for amplifying said RF signals;

direct coupling means for energizing, with said direct current power from said group of solar cells, said amplifying means; and

antenna means coupled to said microwave signal amplifying means so that each one of said modules includes a separate



one of said microwave signal amplifying means for each of said antenna means each antenna means being responsive to said RF amplified signals to radiate a radio frequency (RF) beam into space,

said apparatus being formed on said support structure in a generally extended plane, one face of said structure carrying said solar cells of each of said modules and the other opposite face of said structure carrying said microwave signal amplifying means and said antenna means, said apparatus when in operating position in space having said antennas disposed to face a desired direction and arranged to propagate said RF beam in said desired direction.

4,490,669

CIRCUIT CONFIGURATION FOR GENERATING A TEMPERATURE-INDEPENDENT REFERENCE VOLTAGE

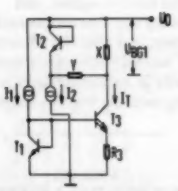
Wilhelm Wilhelm, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 416,084

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1981, 3137504

Int. Cl.³ G05F 3/20

U.S. Cl. 323—313 **2 Claims**



1. Voltage reference circuit arrangement based on energy gap voltage including a diode-resistance path at which a temperature-independent reference voltage corresponding to the energy gap of semiconductor material of components used in the circuit is available, the diode-resistance path comprising a diode and a series circuit of at least two resistors being connected in parallel with said diode, a temperature-independent reference voltage which is an independent fraction of the

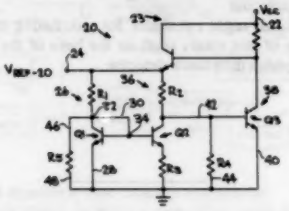
energy gap voltage of the semiconductor material being available at one of said resistors.

4,490,670

VOLTAGE GENERATOR

Thomas H. Wong, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 25, 1982, Ser. No. 436,761
Int. Cl.³ G05F 3/16
U.S. Cl. 323—313 3 Claims



1. In an apparatus having means for generating a reference voltage V_{REF}, in which the reference voltage V_{REF} is changeable non-linearly with temperature, the improvement comprising:

means for making the reference voltage V_{REF} changeable linearly with temperature, wherein said means for generating includes:

a voltage input;

a first circuit path, having a series-connected resistor R_1 and transistor Q_1, connected between said voltage input and ground;

a second circuit path, having a series-connected resistor R_2, transistor Q_2 and resistor R_3, connected between said voltage input and ground;

a third circuit path having a transistor Q_3 connected between said voltage input and ground, said transistor Q_3 having a base connected between said resistor R_2 and the collector of said transistor Q_2; and

a resistor R_4 connected between said base of said transistor Q_3 and ground; and wherein said means for making provides the following equation:

$$\frac{dV_{REF}}{dT} = \left(1 + \frac{R_2}{R_4}\right) \frac{dV_{REF}}{dT} + \left(\frac{R_2}{R_3} \ln \frac{\frac{R_1}{R_5} R_2}{\frac{R_2}{R_4} R_1}\right) \frac{dV_{REF}}{dT},$$

T=temperature, k=Boltzmann's constant, q=charge of an electron, and where R_1, R_2, R_4 and R_5 are chosen such that

$$\frac{R_1}{R_5} = \frac{R_2}{R_4},$$

so that

$$\frac{R_2}{R_1} = \text{constant},$$

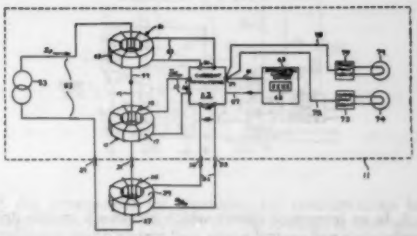
and wherein said means for making comprises a resistor R_5 being connected to eliminate V_{REF} on the right side of said equation.

4,490,671

APPARATUS AND METHOD FOR DETERMINING THE NUMBER OF TURNS ON A SAMPLE COIL

William H. Morong, III, 97 Dalby St., Newton, Mass. 02158

Filed Jan. 17, 1983, Ser. No. 432,147
Int. Cl.³ G01R 31/02, 31/06
U.S. Cl. 324—55 9 Claims



7. A method of determining the turns count of a sample coil wound on a closed magnetic core comprising the steps of:

exciting a first primary winding turn passed through the window of said magnetic core with an alternating current,

exciting a second primary winding turn coupled to a standard coil wound on a magnetic core with said current,

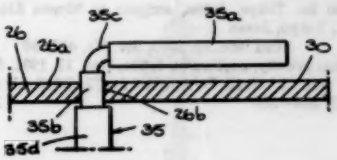
producing a measurement output proportional to the ratio of the current induced into said standard coil to that induced into said sample coil, said output indicating the turns count of said sample coil.

4,490,672

BREAKWAY METER POINTERS AND SHAFTS

John A. Signorelli, 2150 E. 29th St., Brooklyn, N.Y. 11229

Filed Sep. 30, 1982, Ser. No. 429,667
Int. Cl.³ G01R 1/00
U.S. Cl. 324—110 8 Claims



1. A dial indicator device for a register of a utility meter comprising: an elongated member having a shaft portion and an indicator portion integrally connected to said shaft portion and generally disposed in a plane perpendicular thereto, the elongated member being slidably passed axially through a suitable opening of a front panel of said register which is adapted thereat to include dial means on an outer plane surface thereof, a far axial end of said elongated member being rotatably mounted at a rear panel of said register and a near axial end of the elongated member extending outwardly beyond said front register panel to include said integrally connected indicator portion, wherein the elongated member has fracture development means formed thereon whereby the indicator portion of the elongated member is separable from the shaft portion thereof when any attempt is made to manually rotate said indicator portion.

4,490,673

TESTING AN INTEGRATED CIRCUIT CONTAINING A TRISTATE DRIVER AND A CONTROL SIGNAL GENERATING NETWORK THEREFOR

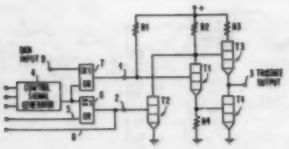
Arnold Blum, Gechingen, and Helmut Schettler, Dettenhausen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1982, Ser. No. 382,267

Claims priority, application European Pat. Off., Oct. 9, 1981, 81 107 134.9

Int. Cl.³ G01R *31/00, 31/26*

U.S. Cl. 324—158 R 10 Claims



1. In an integrated circuit which includes a tristate driver having data and control inputs, said tristate driver assuming an active logical state in response to a data signal at said data input, and assuming a high impedance state in response to a control signal at said control input, said integrated circuit further including a control signal generating network which is connected to said control input for producing said control signal; apparatus for testing said control signal generating network, comprising:

means for connecting said control signal generating network to said data input so that said tristate driver may assume an active logical state in response to said control signal generating network; and

overriding means connected to said control input for preventing said tristate driver from assuming the high impedance state;

whereby said control signal generating network may be tested by monitoring the active logical state of said tristate driver.

4,490,674

ROTATIONAL ANGLE DETECTION DEVICE HAVING TWO MAGNETORESISTIVE SENSING ELEMENTS

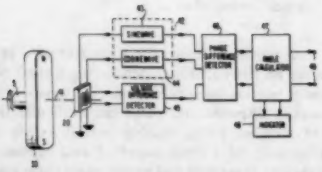
Susumu Ito, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1982, Ser. No. 442,690

Claims priority, application Japan, Nov. 18, 1981, 56-184802

Int. Cl.³ G01B *7/14*; G01N *27/72*; G01R *33/12*

U.S. Cl. 324—208 21 Claims



1. A rotational angle detection device comprising:

a permanent magnet rotatable in response to the rotation of a rotary shaft for generating a rotating magnetic field;

power supplying means for generating sine wave and cosine wave outputs;

a magnetic field sensor having said sine wave and cosine wave outputs applied thereto and being responsive to the magnetic field of said permanent magnet for generating an altered sine wave output and an altered cosine wave output having phase angles dependent upon the rotational position of said permanent magnet, said magnetic field sensor comprising at least two magnetoresistive sensing elements formed of ferromagnetic material and positioned to form a 45° angle therebetween;

a voltage difference detector for detecting the difference between said altered sine wave and altered cosine wave outputs;

a phase difference detector for detecting the phase difference between either of the two outputs of said power supplying means and the output of said voltage difference detector; and

a rotational angle calculator for calculating the rotational angle of said rotary shaft on the basis of the output from said phase difference detector.

4,490,675

ELECTROMAGNET FOR USE IN NMR TOMOGRAPHY

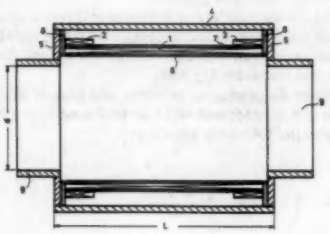
Bertold Knuettel, and Günther Laukien, both of Rheinstetten, Fed. Rep. of Germany, assignors to Bruker Analytische Messtechnik GmbH, Rheinstetten-Forchheim, Fed. Rep. of Germany

Filed Jun. 10, 1982, Ser. No. 386,981

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123493

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—319 20 Claims



1. An electromagnet for producing a constant magnetic field as required for use in NMR tomography of a body to be examined,

said electromagnet including a hollow coil assembly for generating an at least approximately homogeneous magnetic field within said coil assembly,

said coil assembly having a space therein adapted to receive the body to be examined,

said coil assembly comprising at least one cylindrical field coil having a circular cross-section and at least one error coil concentrically disposed around said field coil,

a stable cylindrical shell made of iron and concentrically surrounding said field coil and said error coil,

and supporting means supported by said cylindrical shell for supporting said coils,

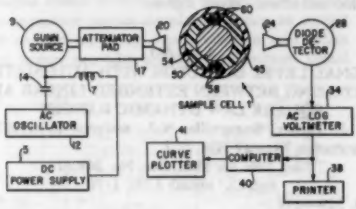
said shell affording a return magnetic path for the magnetic field of said coils and cooperating with said coils to afford a magnetic field of enhanced homogeneity within said coil assembly.

4,490,676

MICROWAVE MEANS FOR MONITORING FLUID IN A CORE OF MATERIAL

Lorne A. Davis, Jr.; Dale F. Brost, and Helen K. Haskin, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,142
Int. Cl.³ G01V 3/17; G01R 27/00; G01N 27/00
U.S. Cl. 324—376 20 Claims



1. An earth formation core monitor comprising:

a sample cell which includes a core of an earth formation containing a liquid,

transmitter means for irradiating said core with a beam of microwave energy, and

receiver means spatially related to said sample cell for receiving a beam of microwave energy after it has passed through said sample cell and for providing an indication representative of a characteristic of the liquid of said core in accordance with received microwave energy, and

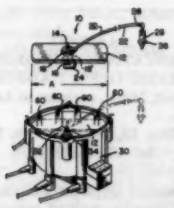
said sample cell also includes means spatially related to said core for preventing any portion of said irradiating beam of microwave energy not passing through said core from being received by said receiver means.

4,490,677

IGNITION COIL TESTING MEANS

Joseph Risner, 245 Delaware Ave., Oakhurst, N.J. 07755

Filed Sep. 30, 1982, Ser. No. 429,858
Int. Cl.³ F02P 17/00
U.S. Cl. 324—388 11 Claims



1. For use with an ignition distributor which has a removable cap with an integral ignition coil and an exposed ignition coil terminal, means for testing said coil for ignition power, comprising:

first means for making electrical contact with the ignition coil terminal in the removable cap; and

second means comprising a pair of electrical conductors defining a spark gap therebetween; wherein

one electrical conductor of said pair is in electrically-conductive connection with said first means; and

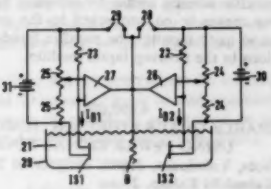
third means (1) for engaging a peripheral surface of said cap, and (2) for mounting at least one of said first and second means thereto.

4,490,678

METHOD OF AND AN APPARATUS FOR MEASURING ION CONCENTRATIONS IN SOLUTIONS

Max Kuisl, Ulm, and Manfred Klein, Heroldstatt, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed May 13, 1982, Ser. No. 377,985
Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119419; Dec. 24, 1981, 3151325
Int. Cl.³ G01N 27/56
U.S. Cl. 324—438 17 Claims



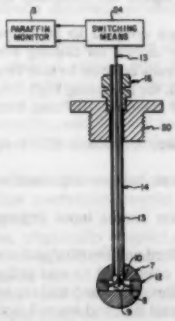
17. An arrangement for measuring ion concentrations in solutions comprising a container for the solution, at least two ion sensitive test electrodes in said container and for producing respective output signals, said test electrodes having different sensitivities only in respect of the ion or ion mixture to be measured, a reference electrode for providing a signal for setting the operating point of the test electrodes and evaluating means fed with the output signals of said test electrodes for producing a measurement result which represents the difference between the output signals and which is essentially independent of properties of said reference electrode and said test electrode which would interfere with accurate measurement.

4,490,679

PROBE TYPE PARAFFIN MONITOR

David Siller, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Aug. 9, 1982, Ser. No. 406,618
Int. Cl.³ G01N 27/00
U.S. Cl. 324—446 3 Claims



1. A paraffin monitor comprising:

a plurality of paraffin sensing means for being coated with paraffin when placed in a liquid medium containing paraffin,

paraffin monitor means for responding to changes in resistance between a pair of the paraffin sensing means,

a housing made of a non-metallic hard material having channels therein and in which the paraffin sensing means are inserted in a predetermined spatial relationship to each other and so that each paraffin sensing means has at least

one surface substantially in conformity to the surface of the housing,

a predetermined length of tubing affixed to the housing,

a plurality of wires, each wire passing through a channel of the housing and the tubing and connected to a corresponding paraffin sensing means,

adapter means affixed to the tubing for permitting insertion of the housing and a portion of the tubing into a pipeline containing a flowing liquid medium having paraffin, and

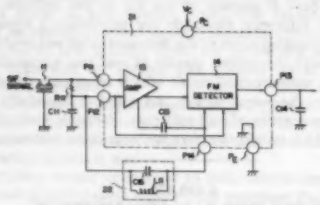
manually operative switching means connected to the paraffin monitor means and to the plurality of paraffin sensing means by the wires for monitoring the paraffin build-up on the paraffin sensing means by selecting pairs of paraffin sensing means to be connected to the paraffin monitor means so as to monitor the paraffin build-up at different locations in the flowing liquid medium.

4,490,680

INTEGRABLE QUADRATURE FM DEMODULATOR USING FEWER SIGNAL PINS

Kuniaki Goto, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 22, 1982, Ser. No. 370,630
Claims priority, application Japan, Apr. 27, 1981, 56-63838
Int. Cl.³ H03D *3/06*
U.S. Cl. 329—117 **9 Claims**



1. A quadrature type frequency modulation (FM) demodulator device for outputting a sound signal based on an inputted sound intermediate frequency (SIF) signal, said device comprising:

band-pass filter means for receiving and filtering an SIF signal;

first circuit means coupled to an output terminal of said band-pass filter means, for causing a bias voltage;

second circuit means coupled to said first circuit means and a first potential, for bypassing high frequency components of said SIF in the output of said band-pass filter means signal;

sound intermedia.e frequency (SIF) signal circuit means including:

a first power source input impressed with said first potential,

a second power source input impressed with a second potential,

first, second, third and fourth signal nodes, said first signal node being connected to said output terminal of said band-pass filter means and said second signal node being coupled to said first and second circuit means, said bias voltage being impressed between said first and second signal nodes,

SIF limiter amplifier means having input terminals respectively coupled to said first and second signal nodes,

phase shifting means having an input coupled to a first output of said SIF limiter amplifier means and an output coupled to said third signal node, for phase shifting the output signal from said amplifier means,

a frequency modulation detector of the phase discriminating type having a first input terminal coupled to a second output terminal of said SIF limiter amplifier means for receiving an output signal from said amplifier means, and having a second input terminal coupled to said third signal node and the output of said phase shifting means for receiving a signal phase-shifted from the output signal of said amplifier means, and having an output terminal connected to said fourth signal mode where an output sound signal is provided; and

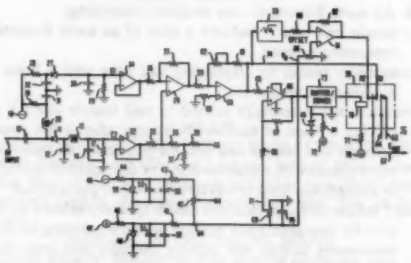
third circuit means directly coupled between said second signal node and said third signal node, for tuning to a sound carrier signal, thereby providing a resonant filter for said sound carrier signal.

4,490,681

SIGNAL LEVEL DETECTOR WITH AUTOMATIC SWITCHING BETWEEN EXTENDED LINEAR AND SQUARE LAW DYNAMIC RANGES

Roland J. Turner, Somerville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 16, 1982, Ser. No. 348,917
Int. Cl.³ H03D *1/06, 1/10*
U.S. Cl. 329—179 **11 Claims**



1. A signal level detector including a circuit having both linear-law and square-law ranges of operation and an intermediate variable-law range of operation and comprising

means for extending the linear-law range of said detector to overlap at least a portion of said intermediate variable-law range, said extending means comprising means for biasing output signals of said detector during at least said variable-law range of operation to levels corresponding approximately to an extrapolation of said linear-law range of operation.

4,490,682

INSTRUMENTATION AMPLIFIER HAVING AUTOMATIC OFFSET ADJUSTMENT

Louis Poulo, Andover, Mass., assignor to Analogic Corporation, Wakefield, Mass.

Filed Dec. 15, 1981, Ser. No. 330,905
Int. Cl.³ H03F *1/26*
U.S. Cl. 330—9 **5 Claims**

1. An instrumentation amplifier including an input and an output having the characteristic of reduced DC offset error signals, said instrumentation amplifier being operable in a normal mode and in an offset adjustment mode according to an externally generated mode control signal, said instrumentation amplifier comprising:

an amplifier of predetermined gain having an input and an output corresponding respectively to said instrumentation amplifier input and output further comprising a plurality of amplifier elements arranged to have a serial signal flowpath;

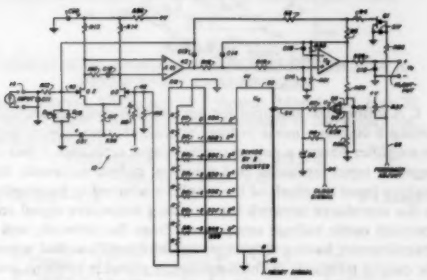
a plurality of feedback paths, each at least around one of said plurality of amplifier elements wherein at least one said plurality of feedback paths is selected to provide a low-pass filter characteristic for said instrumentation amplifier;

a negative feedback network connected between said instru-

mentation amplifier input and output, said network being controllable according to said mode control signal to reduce the negative feedback produced thereby when in the offset adjustment mode;

comparator means connected to said amplifier output and a common reference point producing a comparator output signal whenever said DC offset error signal does not substantially equal zero volts relative to said common reference point;

offset adjustment means receiving said mode control signal and said comparator output signal and having an output connected to said amplifier input, wherein said offset adjustment means provides an offset adjustment signal



upon the occurrence of said comparator output signal and said mode control signal in the offset adjustment mode, said offset adjustment signal reducing said DC offset error signal relative to said common reference point, whereby said DC offset error signal is further reduced when the instrumentation amplifier is returned to the normal mode, said offset adjustment means further comprising:

a digital counter receiving a periodic clock signal controlled by said mode control signal, said digital counter having a digital output related to a submultiple of said clock signal;

a voltage reference; and

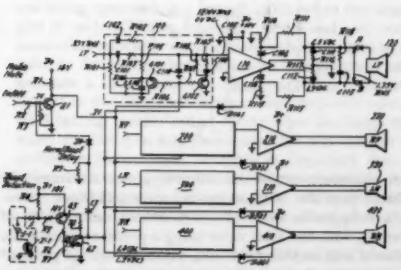
a resistor network connected to said voltage reference and said digital output providing said offset signal.

4,490,683

ELECTRONIC CONTROL SWITCH FOR A POWER BOOST AMPLIFIER

Dennis W. Rhee, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 429,416
Int. Cl.³ H03G 9/02
U.S. Cl. 330—51 **4 Claims**



1. An amplifier control switch comprising: means for providing a variable electrical signal in the audio frequency range at a level determined by said variable signal providing means;

means for amplifying said variable signal by a predetermined factor;

means connected to the output of said amplifying means for mechanically reproducing the amplified variable signal;

means between said variable signal providing means and said amplifying means having a plurality of selective circuits including an attentuator circuit for proportionally attentuating said variable signal from said variable signal providing means prior to its input to said amplifying means so that said amplifying means outputs a signal at approximately the same level as output from said variable signal providing means and an equalizing circuit for enhancing said variable signal from said variable signal providing means prior to its input to said amplifying means over a predetermined frequency range without significant attentuation; and

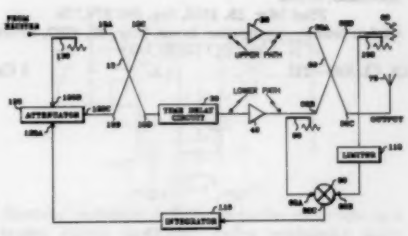
means connected to said selective circuit means for selecting one of either of said attentuator circuit or said equalizing circuit to correspondingly supply an attentuated or enhanced variable input signal to said amplifying means.

4,490,684

ADAPTIVE QUADRATURE COMBINING APPARATUS

Robert L. Epsom, Hanover Park, and Paul H. Gallus, Chicago, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 3, 1983, Ser. No. 455,347
Int. Cl.³ H03F 1/32
U.S. Cl. 330—149 **7 Claims**



1. A circuit for combining radio frequency signals in a manner minimizing intermodulation distortion products comprising:

first quadrature coupler means, having a main input port, an isolation input port, coupled output port and a feedthrough output port, for spliting a radio frequency input signal into first and second signals exhibiting a quadrature relationship and for providing said first and second signals to said coupled output port and said feedthrough output port, respectively;

first amplifying means, electrically coupled to the coupled output port of said first quadrature coupler means, for amplying said first signal;

second amplifying means, electrically coupled to the feedthrough output port of said first quadrature coupler means, for amplifying said second signal;

second quadrature coupler means, having a coupled input port, a feedthrough input port, an isolation output port, and a main output port, for combining signals provided to the coupled input port and the feedthrough input port of said second quadrature coupler means, said feedthrough input port and said coupled input port of said second quadrature coupler means being electrically coupled to said first and second amplifying means, respectively;

phase detector means, having first and second inputs respectively coupled to the coupled input port and the isolation output port of said second quadrature coupler means, for generating a phase detect signal exhibiting an amplitude proportional to the phase difference of signals at the cou-

pled input port and the isolation output port of said second quadrature coupler means, and

voltage variable attenuator means, operatively electrically coupled to the main input port and isolation input port of said first quadrature coupler means and to said phase detector means, for providing a selected resistance proportional to said phase detect signal such that the differential phase of signals provided to the coupled input port and the feedthrough input port of said second quadrature combining means is appropriately adjusted to a value which causes the phase detect signal to be driven substantially to zero,

whereby signals provided to the feedthrough input port and the coupled input port of said second quadrature coupler means are maintained substantially in quadrature relationship with respect to each other such that intermodulation products are substantially reduced.

4,490,685

DIFFERENTIAL AMPLIFIER

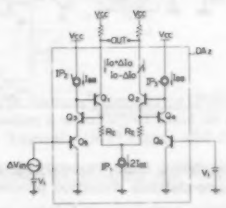
Yoshiaki Sano, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 25, 1983, Ser. No. 478,720

Claims priority, application Japan, Mar. 30, 1982, 57-50094

Int. Cl.³ H03F *3/45*

U.S. Cl. 330—252 **3 Claims**



1. A differential amplifier operatively connected to receive first and second input signals, comprising:

a first current source for generating a first current;

second and third current sources, each of which generates a second current;

emitter resistors operatively connected to said first current source;

first and second transistors having a first polarity, operatively connected to said second and third current sources, said first and second transistors having collectors serving as output terminals, having bases operatively connected to said second and third current sources, respectively, and having emitters operatively connected to said emitter resistors;

a third transistor having the first polarity, having a collector operatively connected to said second current source, having a base operatively connected to said emitter of said first transistor, and having an emitter operatively connected to receive the first input signal; and

a fourth transistor having the first polarity, having a collector operatively connected to said third current source, having a base operatively connected to said emitter of said second transistor, and having an emitter operatively connected to receive the second input signal.

4,490,686

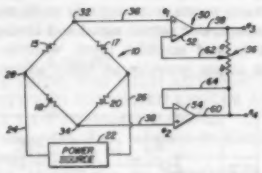
DIFFERENTIAL AMPLIFIER WITH COMMON MODE REJECTION MEANS

John Dimeff, San Jose, Calif., assignor to Mark Telephone Products, Inc., Sunnyvale, Calif.

Filed Jul. 2, 1982, Ser. No. 394,991

Int. Cl.³ H03F *3/45, 1/26*

U.S. Cl. 330—258 **10 Claims**



1. A differential amplifier for use with a transducer network having a common mode voltage applied thereto, comprising: an amplifier having a pair of positive input terminals, a pair of negative input terminals, and a pair of output terminals, the positive input terminals of the amplifier adapted to be coupled to the transducer network for receiving respective signal and common mode voltage components from the network; and a potentiometer having respective end terminals coupled across the output terminals of the amplifier, a shiftable element coupled to one of the negative input terminals, and one of the end terminals coupled to the other of the negative input terminals for producing a first voltage at a one of the pair of output terminals and a second voltage at the other of the pair of output terminals, the difference of said first and second voltages forming an output voltage of the amplifier that has the common mode voltage components removed therefrom.

4,490,687

ELECTRONIC AMPLIFIER

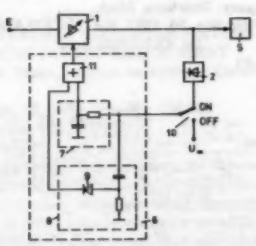
Ernst F. Schröder, Hanover, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 17, 1982, Ser. No. 450,632

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1981, 3150436

Int. Cl.³ H03G *3/20*

U.S. Cl. 330—279 **7 Claims**



1. An electronic amplifier comprising: an electronically controllable amplifier element having a control input for receiving a voltage the value of which determines the gain of said element, with one such value being a predetermined basic gain value of said amplifier element; a control voltage generating circuit for generating a control voltage whose value determines the voltage at the control input of said amplifier element, said element and circuit being constructed for causing the gain of said amplifier element to be unity for one voltage value at its control input and to be different than unity for other voltage

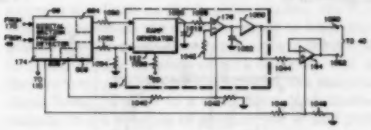
values; a nonlinear filter unit connected between said control voltage generating circuit and said amplifier element control input for supplying to said control input a voltage determined by said control voltage, said filter unit including an integrating branch and a differentiating branch having a rectifier device for causing said differentiating branch to be effective only during periods when the control voltage is varying in a selected direction; means for switching said amplifier element and said control voltage generating circuit to a mode of operation in which said amplifier element operates with a constant gain value; and an additional switch connected to said differentiating branch for selectively disabling that branch when said switching means establishes the mode of operation in which said amplifier element operates with a constant gain value.

4,490,688

DIGITAL AND ANALOG PHASE DETECTOR FOR A FREQUENCY SYNTHESIZER

Jaime A. Borras, Hialeah; Jose I. Suarez, Miami, and Alan M. Victor, Cooper City, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 6, 1981, Ser. No. 251,570
Int. Cl.³ H03L 7/12
U.S. Cl. 331—1 A **5 Claims**



1. A sample and hold phase detector for the phase locked loop portion of a frequency synthesizer capable of being switched to generate any one of a plurality of frequencies, said detector receiving a reference frequency signal and a voltage controlled oscillator signal, said voltage controlled oscillator signal being derived from a voltage controlled oscillator, said phase detector including both analog and digital portions which together generate a detector output voltage signal having a range of voltage values and which are coupled through a loop filter to the voltage controlled oscillator, said phase detector comprising:

digital detecting means for detecting both the frequency and phase difference between said reference frequency signal and said voltage controlled oscillator signal, said digital detecting means being operative in a first mode to generate a first control signal when said reference frequency signal and said voltage controlled oscillator signal exhibit a difference in frequency, said first control signal including information related to said difference in frequency, and being operative in a second mode when the frequencies of said reference frequency signal and said voltage controlled oscillator signal are substantially equal to periodically detect the phase difference therebetween and to generate a second control signal including information related to the difference in phase therebetween, said digital detecting means further producing a discharge signal when operating in said first mode and said voltage controlled oscillator signal is higher in frequency than said reference frequency signal, said digital detecting means also producing said discharge signal when operating in said second mode following detection of said phase difference;

energy storing means, coupled to said digital detecting means, for storing said first control signal when said digital detecting means is operating in said first mode, and for storing said second control signal when said digital detecting means is operating in said second mode;

discharging means, operatively coupled to said energy storing means and responsive to said discharge signal, for substantially completely discharging said energy storing means in response thereto;

first current amplifier means, coupled to said digital detecting means to be responsive to said first control signal, the output of said first current amplifier means being connected to bypass a portion of said loop filter whenever said digital detecting means enters said first mode, to supply voltage to said voltage controlled oscillator to rapidly tune said voltage controlled oscillator to a desired frequency; and

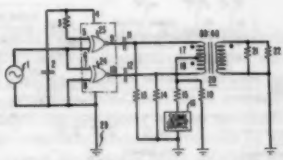
second current amplifier means, having an input operatively coupled to said energy storing means and responsive to the first or second control signal stored therein, said second current amplifier being adapted to be coupled via said loop filter to said voltage controlled oscillator, for maintaining said voltage controlled oscillator at a desired tuning position when said digital detecting means is operating in said second mode.

4,490,689

BALANCED MODULATOR USING LOGIC GATES FOR DSBSC OUTPUT

Kenneth Jong, Maplewood, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 20, 1982, Ser. No. 419,803
Int. Cl.³ H03C 1/54
U.S. Cl. 332—31 T **8 Claims**



7. A balanced modulator including a carrier wave source, a center-tapped output transformer and a modulating wave source for modulating the output from said carrier wave source and delivery to said transformer

characterized in that

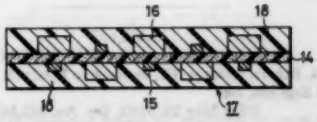
said carrier wave source drives the primary winding of the output transformer through a pair of anti-coincidence gates connected in dual complementary fashion in series with a pair of direct-current isolating capacitors, and a direct-current bias for operation of the pair of anti-coincidence gates, generated across an external capacitor, is derived from leakage current from the carrier wave source.

4,490,690

STRIP LINE CABLE

Hirosuki Suzuki, Tokorozawa Saitama, Japan, assignor to Junkosha Company, Ltd., Tokyo, Japan

Filed Apr. 22, 1982, Ser. No. 370,789
The portion of the term of this patent subsequent to May 3, 2000, has been disclaimed.
Int. Cl.³ H01P 3/08
U.S. Cl. 333—1 **6 Claims**



1. A stripline comprising:

a porous dielectric layer; and

a plurality of sets of narrow signal conductors and wider ground conductors which are disposed in confronting relation to each other with the porous dielectric layer sandwiched therebetween, said signal and ground conductors being alternately arranged transversely of the conductors, said sets of signal and ground conductors being covered with a layer of solid nonporous resin.

4,490,691

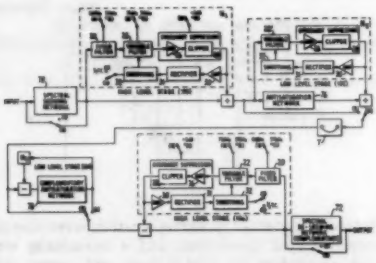
COMPRESSOR-EXPANDER CIRCUITS AND, CIRCUIT ARRANGEMENTS FOR MODIFYING DYNAMIC RANGE, FOR SUPPRESSING MID-FREQUENCY MODULATION EFFECTS AND FOR REDUCING MEDIA OVERLOAD

Ray M. Dolby, 50 Walnut St., San Francisco, Calif. 94118

Continuation-in-part of Ser. No. 292,958, Aug. 14, 1981, abandoned, and a continuation-in-part of Ser. No. 275,382, Jun. 19, 1981, abandoned, and a continuation-in-part of Ser. No. 275,205, Jun. 19, 1981, abandoned, and a continuation-in-part of Ser. No. 275,204, Jun. 19, 1981, abandoned, and a continuation-in-part of Ser. No. 180,771, Aug. 22, 1980, abandoned, and a continuation-in-part of Ser. No. 163,950, Jun. 30, 1980, abandoned. This application Sep. 10, 1981, Ser. No. 300,741

Int. Cl.³ H04B *1/64*

U.S. Cl. 333—14 **208 Claims**



1. A circuit for modifying the dynamic range of an input signal, comprising first circuit means with a bi-linear characteristic composed of a low level portion of substantially constant gain up to a threshold, an intermediate level portion, above the threshold, of changing gain providing a maximum compression ratio or expansion ratio, and a high level portion of substantially constant gain different from the gain of the low level portion, and at least one second circuit means, which also has a bi-linear characteristic within a frequency range common to the circuit means, in series with the first circuit means thereby to provide an overall characteristic which is also bi-linear, the intermediate level portions of the characteristics of the circuit means being staggered within a frequency range common to the circuit means such as to provide a change of gain over a wider range of intermediate input levels than for any of the circuit means individually, and an increased difference between the gains at low and high input levels, but with an overall maximum compression or expansion ratio which is substantially no greater than that of any single circuit means, by virtue of the staggering.

4,490,692

REVERSE EQUALIZATION NETWORK

Ian A. Schorr, Chicago, Ill., assignor to Rockwell International, El Segundo, Del.

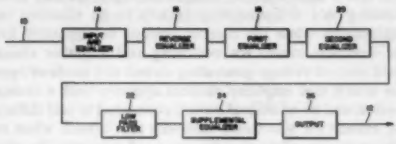
Filed May 26, 1982, Ser. No. 382,067

Int. Cl.³ H03H *11/06*

U.S. Cl. 333—28 R **22 Claims**

1. A reverse equalization network for use with an equalizer circuit having an input means, at least one equalizer means and an output means said reverse equalization network comprising:

means for reverse equalizing connected between the input means and the equalizer means;



means for low pass filtering connected to the equalizer means; and

means for supplemental equalizing connected between said means for low pass filtering and the output means.

4,490,693

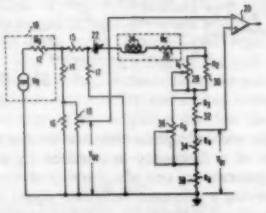
I.F. DELAY EQUALIZER FOR A UHF TV TRANSMITTER

William L. Behrend, Pittsburgh, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 18, 1983, Ser. No. 495,723

Int. Cl.³ H04B *3/14*; H03H *7/03*

U.S. Cl. 333—28 R **7 Claims**



1. A circuit comprising an equivalent voltage source having an equivalent internal resistance; a series resonant circuit coupled to said source and having an inductor and a capacitor, said inductor having an inherent resistance; a first resistor coupled to said resonant circuit; a first voltage divider coupled to said first resistor and including a pair of series connected equal value resistors; a variable resistor coupled in parallel with said voltage divider; a second resistor coupled between said voltage divider and said voltage source and having a resistance equal to the sum total of the resistances of said inherent resistance, said equivalent internal resistance, and said first resistor; and providing means for providing an output voltage from the junction of said pair of resistors relative to the junction of said second resistor and said voltage source; whereby said adjustable resistor can vary the Q of said circuit without changing said output voltage.

4,490,694

MICROWAVE SWITCH WHEREIN PIN DIODE IS MOUNTED ORTHOGONAL TO MICROSTRIP SUBSTRATE

James L. Godbout, San Jose, Calif., assignor to Eaton Corporation, Sunnyvale, Calif.

Filed Jul. 28, 1982, Ser. No. 402,630

Int. Cl.³ H01P *1/15*

U.S. Cl. 333—104 **7 Claims**

1. An improved microwave multi-throw switch comprising:

a support structure for insulatively supporting a plurality of stripline segments;

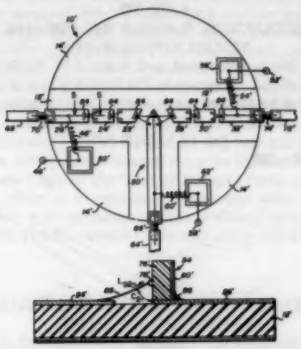
a first conductive stripline aligned along a first common path on said structure;

a second conductive stripling aligned along a second com-

mon path on said structure and insulated from the first conductive stripline;

a common conductive stripline aligned along a third common path on said structure insulated fron the first and second striplines; and

at least one PIN diode having a junction on one surface and



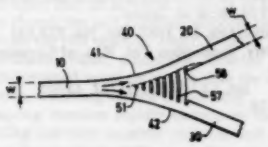
a conductive layer on the opposite surface, the PIN diode being mounted on the structure along at least one of said paths with the conductive layer surface substantially orthogonal to the stripline of said one path and adhered thereto through a conductive conduit, the junction of the diode being adhered to a conductive lead means which extends to the stripline of another one of said paths.

4,490,695

WIDEBAND POWER ADDER-DIVIDER FOR HIGH-FREQUENCY CIRCUITS AND IMPEDANCE TRANSFORMER REALIZED ON THE BASIS OF THE ADDER-DIVIDER

Frans C. de Ronde, Lesigny, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,933
Claims priority, application France, Mar. 12, 1982, 82 04251
Int. Cl.³ H01P *5/12*; H03H *7/48, 7/38*
U.S. Cl. 333—128 **7 Claims**



1. A wide band microstrip power adder-divider comprising:

(a) a first conductive transmission line for passing a current having a frequency in said band;

(b) second and third conductive transmission lines in which the current is to be distributed; and

(c) a wedge-shaped conductive transition section joining the first to the second and third conductive transmission lines, said transition section having two arc-shaped outer edges which at one end of said section meet respective outer edges of the first transmission line, and at the other end of said section meet respective outer edges of the second and third transmission lines,

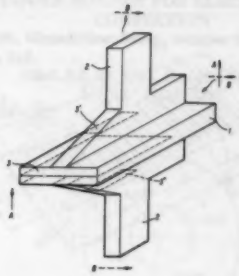
said transition section including a plurality of parallel slots extending transversely of the direction of propagation of the current, opposite ends of said slots each being spaced from the nearest arc-shaped outer edge by a distance which is less than the width of each of said second and third conductive transmission lines.

4,490,696

CROSSED WAVEGUIDE TYPE POLARIZATION SEPARATOR

Fumio Takeda; Osami Ishida, and Yoji Isoda, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 329,074
Claims priority, application Japan, Mar. 19, 1981, 56-40130
Int. Cl.³ H01P *5/12, 1/161*
U.S. Cl. 333—137 **3 Claims**



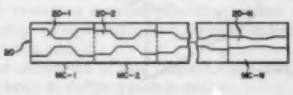
1. A crossed rectangular waveguide type polarization separator which comprises a crossed rectangular waveguide for propagating orthogonal linear polarized waves having a first rectangular portion perpendicular to a second rectangular portion, at least one conductor septum rectangular in shape fitted in said crossed rectangular waveguide to totally reflect only one polarized wave in said linear polarized waves in such a manner that said one polarized wave is reflected perpendicular to said at least one rectangular septum, at least a first subwaveguide for receiving said one linear polarized wave formed by the total reflection of said conductor septum, and a second subwaveguide for receiving the other linear polarized wave of said linear polarized wave which is not reflected by said conductor septum, wherein the width of said first rectangular portion is much greater than the height of said first rectangular portion, and wherein said at least one conductor septum has a central conductor septum and conductor septums, parallel to said central conductor septum, placed at both sides of said central conductor septum.

4,490,697

SIGNAL PROPAGATING DEVICE FOR A PLURALITY OF MEMORY CELLS

Hiroshi Yasuda, Tokyo, and Kiyofumi Ochii, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 7, 1982, Ser. No. 386,091
Claims priority, application Japan, Jun. 10, 1981, 56-89299
Int. Cl.³ H03H *7/30*; H01P *9/00*
U.S. Cl. 333—156 **3 Claims**



1. A signal propagating device for receiving an input signal at an input end thereof and supplying the input signal to a plurality of memory cells arranged in a chain, comprising:

signal propagation means connected to transmit the input signal and having a plurality of word line segments electrically coupled to said plurality of memory cells, respectively, where the average width of said word line segments decreases as said segments extend from said input end.

4,490,698

SURFACE ACOUSTIC WAVE BANDPASS FILTER

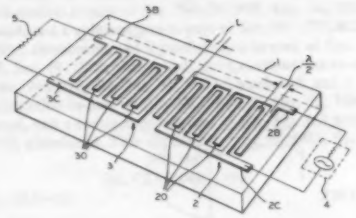
Mikio Morimoto, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1983, Ser. No. 460,581

Claims priority, application Japan, Jan. 26, 1982, 57-10305

Int. Cl.³ H03H *9/64, 9/25*

U.S. Cl. 333—193 **7 Claims**



1. A surface acoustic wave bandpass filter comprising:

a piezoelectric substrate for propagating a surface acoustic wave;

input transducer means formed on the substrate and having a pair of interdigital electrodes including a plurality of interdigitated electrode fingers for exciting a surface acoustic wave in response to an electrical signal applied thereto; and

output transducer means formed on said substrate and having a structure which is substantially the same as the structure of said input transducer means for developing said surface acoustic wave propagated in said substrate into a filtered electrical signal, said input and output transducer means being separated by a distance L which satisfies the relationship where $\lambda/2\ n<L<\lambda/2\ (n+1)$, where n is a positive integer and where $\lambda/2$ represents the distance between the centers of adjacent electrode fingers.

4,490,699

INTERMEDIATE FREQUENCY BAND-PASS FILTER

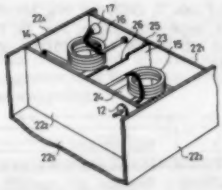
Hiroyuki Yanagida, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed May 26, 1983, Ser. No. 498,455

Claims priority, application Japan, May 27, 1982, 57-76893[U]

Int. Cl.³ H01P *1/20, 7/01, 7/09*

U.S. Cl. 333—202 **3 Claims**



1. An intermediate frequency band-pass filter for providing a pass band, comprising a frame forming a hollow surrounded region, a shield plate mounted in said frame and dividing said hollow surrounded region into two spaces, said shield plate having a coupling window, and two resonators disposed respectively in said spaces and coupled through said coupling window, said shield plate having in an edge thereof a step serving as a trap which provides a frequency suppresion capability in the vicinity of the pass band of the filter.

4,490,700

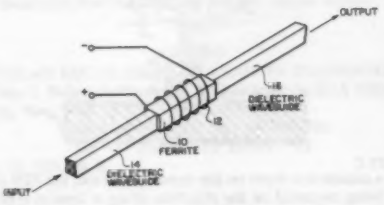
DIELECTRIC WAVEGUIDE FERRITE MODULATOR/SWITCH

Richard A. Stern, Allenwood, and Richard W. Babbitt, Fairhaven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 1, 1982, Ser. No. 445,799

Int. Cl.³ H01P *1/11*

U.S. Cl. 333—258 **5 Claims**



1. A dielectric waveguide switch comprising:

a ferrite waveguide section having an input end and an output end,

a first dielectric waveguide means connected to said input end of said ferrite section for providing an input signal and a second dielectric waveguide means connected to said output end for receiving an output signal from said ferrite section, and

means for selectively rotating the polarization of signals propagating through said ferrite waveguide section.

4,490,701

ELECTROMAGNETIC SWITCHGEAR COMPRISING A MAGNETIC DRIVE AND A CONTACT APPARATUS PLACED THEREABOVE

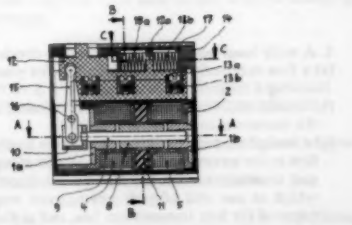
Bernhard Dietrich, Eichenau, Fed. Rep. of Germany; Hidetoshi Matsushita, Ibaraki, and Tetsuo Mori, Hirakata, both of Japan, assignors to SDS-Elektro GmbH and Matsushita Electric Works, Ltd., both of, Japan

Filed Aug. 16, 1983, Ser. No. 523,534

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1982, 3230564

Int. Cl.³ H01H *51/22, 45/00*

U.S. Cl. 335—78 **12 Claims**



1. Electromagnetic switchgear comprising a magnetic drive having a yoke which contains a permanent magnet arrangement and surrounds a coil form whose continuous bore contains an armature which, by means of a reverse-transfer lever,

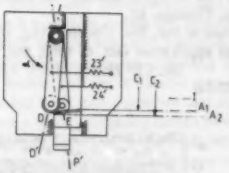
actuates an adjusting slider mounted with allowance for sliding in a contact apparatus placed above the coil form parallel to the longitudinal axis thereof, the adjusting slider being in operative connection with two return springs preloaded in opposite directions, and carrying spring-loaded bridge contacts to each of which are assigned two opposed fixed contacts, characterized in that said coil form is subdivided into two spaced-apart chambers arranged side by side which receive corresponding coil windings, that said permanent magnet arrangement lies symmetrically to the longitudinal axis of said coil form between said two chambers, is polarized at right angles to the longitudinal axis of the coil former, and has a through-opening for said armature which corresponds substantially to the diameter of the bore of the coil form, said armature being mounted on a non-magnetic guide bar and having two end faces which cooperate with the pole faces of the yoke located in the area of the end openings of the bore of the coil form, and that the adjusting slider is in operative connection with both return springs only in its geometric middle position, but upon leaving said middle position stresses only one of the return springs.

4,490,702

DETACHABLE DEVICE FOR LOCKING A CONTACTOR IN ITS "ON" POSITION

Alain D. G. Dumont, Certy, and René Fouret, Rueil Malmaison, both of France, assignors to La Telemecanique Electrique, France

Filed Mar. 21, 1983, Ser. No. 477,579
Claims priority, application France, Mar. 19, 1982, 82 04681
Int. Cl.³ H01H 9/20
U.S. Cl. 335—169 9 Claims



1. In combination with a contactor having contacts and a contact controlling movable member translatable along a predetermined direction from a rest position in which the said contacts are open into an actuated position in which the said contacts are closed, the said actuated position being located at a distance from the rest position which is either smaller than a first predetermined value, comprised between said first and second predetermined value or higher than the second predetermined value, a locking device comprising:

(a) a coupling member rigidly connected to said contact controlling movable member and first and second thrust plane surfaces substantially at right angles to the said predetermined direction;

(b) first and second elongate substantially parallel locking levers mounted for oscillating about a stationary axis which is substantially parallel to said thrust plane surfaces, each lever having a locking surface at the end thereof remote from said axis, the respective distances from the said axis to the respective thrust surfaces and the respective distances from the said axis to the respective locking surfaces being so predetermined that the locking surface of the first lever will engage the first thrust surface when the said actuated position is located at a distance from the said rest position smaller than the said first predetermined value, whereas the locking surface of the second lever will engage the second thrust surface when the said actuated position is located at a distance from the said rest position comprised between said first and second predetermined values;

(c) first and second spring means respectively attached to the first and second levers for pivoting the said levers from a rest position in a direction which brings their respective locking surfaces into engagement with the respective thrust plane surface; and

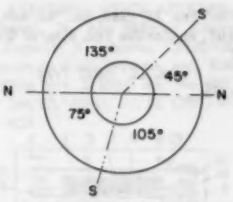
(d) unlocking means comprising a power supply circuit and an electromagnet having a coil connected in said power supplying circuit and a movable member, said unlocking means further comprising mechanical means for transmitting the movement of said movable member to said locking levers to reset the said locking levers to their rest position.

4,490,703

MULTIPOLE MAGNET FOR ELECTRON BEAM CORRECTION

Roy L. Ruth, Meundsview, Minn., assignor to Ball Corporation, Muncie, Ind.

Filed Jul. 28, 1982, Ser. No. 402,655
Int. Cl.³ H01F 7/02
U.S. Cl. 335—212 14 Claims



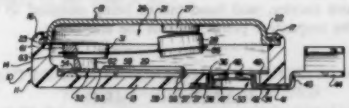
1. A magnetic element for use with a cathode ray tube to control the path of electrons within the tube, the element comprising a disk-shaped permanent magnet having, in the plane of the disk, an asymmetric quadrapole magnetic field, the distance measured along the periphery of the disk between any adjacent two poles being different from the distance measured along the periphery of the disk between any other adjacent two poles.

4,490,704

THERMALLY RESPONSIVE SWITCHING DEVICE

Harold F. Snider, and Gerard H. Risacher, both of Mansfield, Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Sep. 14, 1983, Ser. No. 532,080
Int. Cl.³ H01H 37/04, 37/52
U.S. Cl. 337—372 10 Claims



1. A thermally responsive switch comprising a housing assembly including:

a cup-shaped body member formed of non-metallic electrically insulating material providing an end wall with an opening therethrough and perpendicularly extending sidewalls; and

a cover connected to said sidewalls and cooperating with said body to define a switch cavity,

said sidewalls providing a shoulder extending around said cavity and reduced thickness wall extensions extending beyond said flanges.

said cover providing a peripheral flange seated against said shoulder,

said sidewalls extensions being deformed around said peripheral flange securing said peripheral flange against said shoulder, and

switch means mounted on said housing assembly within said cavity,

said switch means including an elongated heater connected at one end through said opening to an external terminal,

an elongated bimetal snap element mounted at one end thereof on the other end of said heater and overlying said heater in heat exchange relationship therewith,

a movable contact carried by the other end of said snap element, and

a fixed contact mounted on said cover,

said snap element operating in response to predetermined temperatures to move said movable contact into and out of engagement with said fixed contact with snap action.

4,490,705

ELECTROMAGNETIC RELAY

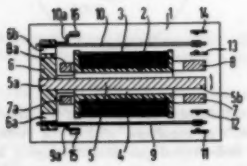
Erwin Mueller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 24, 1983, Ser. No. 469,289

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1982, 3213737

Int. Cl.³ H01F 7/14

U.S. Cl. 335—276 17 Claims



11. An electro-magnetic relay, comprising: an elongated armature connected to an armature carrier carrying a first contact element; an excitation coil of the relay in association with a coil supporting body; the armature being positioned in association with the coil such that when the coil is excited the armature moves causing a slight rotation of the armature carrier; a second contact element in association with the first contact element such that when the armature carrier rotates slightly the two contact elements can make or break an electrical contact; band means rotationally coupling the armature carrier to the coil body such that when the armature carrier rotates the band means provides minimal torsional rotational resistance; and the band means comprising first and second taut bands projecting outwardly from and at opposite sides of the armature carrier, said band means being coupled to the coil body by respective projections of the coil body.

4,490,706

ELECTRONIC PARTS

Hiroshi Satou, and Tadao Yahagi, both of Akita, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 8, 1982, Ser. No. 396,208

Claims priority, application Japan, Jul. 9, 1981, 56-101189; Mar. 23, 1982, 57-40544; Mar. 23, 1982, 57-40546; May 8, 1982, 57-66849

Int. Cl.³ H01F 27/04, 15/10

U.S. Cl. 336—96 3 Claims

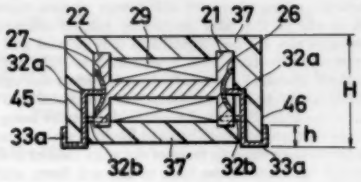
1. An inductor comprising:

(a) a core having two opposing ends;

(b) a winding wound about the core;

(c) a pair of connector electrodes disposed on the ends of the core;

(d) a pair of terminals connected to the connector electrodes and extending downwardly therefrom, each terminal having a connector finger centrally extending from an upper portion of the terminal for connection to one of the connector electrodes and a pair of spaced apart support fingers parallely extending from an intermediate portion of the terminal supporting the core;



(e) a covering of molded insulating resin encapsulating the winding, core, and the upper and intermediate portions of the terminals, a lower portion of each terminal protruding through the covering and being bent horizontally along a portion of the bottom of the covering and upwardly along and in contact with at least a portion of the side of the covering.

4,490,707

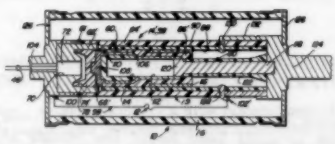
EXPLOSIVELY-ACTUATED, MULTI-GAP HIGH VOLTAGE SWITCH

Raymond P. O'Leary, Evanston, Ill., assignor to S&C Electric Company, Chicago, Ill.

Continuation of Ser. No. 179,366, Aug. 18, 1980, abandoned. This application Oct. 6, 1983, Ser. No. 539,396

Int. Cl.³ H01H 85/18, 33/06

U.S. Cl. 337—6 18 Claims



1. An electrical switch for opening a first current path in which the switch is included, comprising:

a pair of normally electrically interconnected contacts which are separable along a first line of direction to both break the electrical interconnection and to form a first gap therebetween;

first means for inserting a solid electrical insulator between the contacts as they separate to electrically insulate the first gap;

a terminal in the first path;

second means for electrically connecting one contact to the terminal when the contacts are interconnected, a second gap forming between the one contact and the terminal as the contacts separate at a predetermined time after the formation of the first gap;

third means for inserting a solid electrical insulator between the one contact and the terminal as the contacts separate to electrically insulate the second gap;

fourth means for defining with the first means a chamber, pressurization of the chamber separating the contacts;

ignitable means in the chamber, ignition of which pressurizes the chamber;

a second current path; and

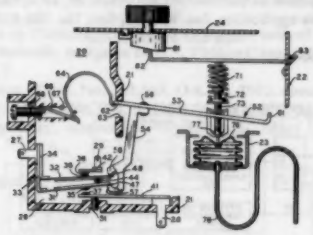
fifth means for connecting the second path in shunt with the first path after the first gap is formed.

4,490,708

CONDITION RESPONSIVE ELECTRIC SWITCH SYSTEM, ELECTRICAL SWITCHING DEVICE AND METHOD OF OPERATION THEREOF

Paige W. Thompson, and Ronald W. Kelly, both of Morrison, Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Jun. 24, 1982, Ser. No. 391,607
Int. Cl.³ H01H 37/12, 37/38, 37/60
U.S. Cl. 337—320 24 Claims



1. A condition responsive electric switch system comprising switch means including at least one set of contact elements defining a preselected open position, a preselected closed position, and a preselected initial contact make-break position, disposed between said open and closed positions; switch actuating means movable in actuating relation with said switch means for operating said contact elements selectively into and out of said preselected open, closed, and initial make-break positions; spring means and temperature responsive means connected to switch actuating means for imparting motion to said switch actuating means, with said spring means and temperature responsive means creating opposing forces on said switch actuating means; and the condition responsive electric switch system having both major positive and negative spring gradients including a force producing means having maximum absolute positive gradient forces F_1 and F_2 in which F_1=maximum absolute positive gradient pre-load force on said contact elements at said preselected initial make-break position; F_2=maximum absolute positive gradient force on said contact elements at said preselected closed position wherein the value of the expression $(F_2-F_1)/F_2$ approaches unity and a net contact element force F_n is produced generally in the vicinity of zero as the contact elements travel at least through said preselected initial contact make-break position.

4,490,709

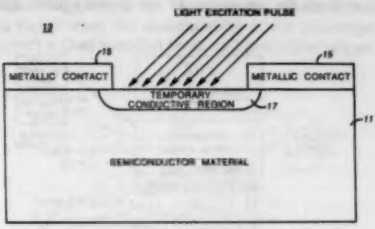
INP:FE PHOTOCONDUCTING DEVICE

Robert B. Hammond, Los Alamos; Nicholas G. Paulter, Albuquerque, and Ronald S. Wagner, Los Alamos, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 6, 1982, Ser. No. 447,349
Int. Cl.³ H01L 31/08, 27/14
U.S. Cl. 338—15 3 Claims

1. A high speed photoconducting device exhibiting photoconductive gain comprising:

a wafer of Fe-doped, semi-insulating InP having a bulk resistivity greater than 2×10^7 ohm-cm and Fe concentration in the order of 2×10^{15} to 4×10^{16} cm^{-3}; and a pair of gold alloy contacts evaporated and annealed at a temperature of at least 425° C. on said wafer having a



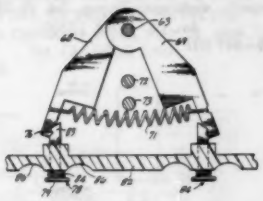
contact separation on the order of 25 microns therebetween for the impingement thereon by photons.

4,490,710

CONTROL STICK ASSEMBLY

Joseph D. Kopsho, Jr., San Marcos; Edward D. Suszynski, Vista, and Reginald S. Johnson, Cardiff-By-The-Sea, all of Calif., assignors to Kraft Systems, Inc., Vista, Calif.

Filed Nov. 5, 1982, Ser. No. 439,360
Int. Cl.³ H01C 10/16; G05G 9/04
U.S. Cl. 338—128 32 Claims



1. A control stick assembly comprising:

a movable control stick;

means for generating an electric signal representative of control stick position;

spring means for urging the control stick toward a select position; and

means for reversibly disengaging the spring means to thereby prevent said spring means from urging the control stick toward the select position without restricting movement of the control stick.

4,490,711

ELECTRONIC PROGRAMMABLE MULTIPLE ALARM TIMING DEVICE AND RECORD

Robert W. Johnston, 754 Southhampton, Palo Alto, Calif. 94303

Filed Dec. 21, 1981, Ser. No. 332,573
Int. Cl.³ G04G 13/02; G04C 23/08
U.S. Cl. 340—309.4 16 Claims

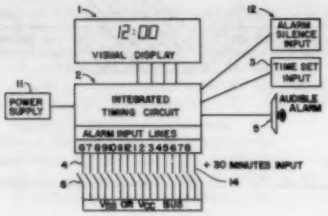
1. A structure for assisting in keeping track of the times at which events are to occur which comprises:

means for generating signals representing up to N different times at which specified events are to occur, where N is a selected positive integer;

means for setting selected times at which certain events are to occur, said means for setting said selected times comprising switch means for indicating that a selected number n of said N times are times at which selected events should occur, where n is an integer given by $1<n<N$;

alarm means for indicating the occurrence of each of said n times at which selected events should occur; and

means for silencing said alarm means once said alarm means indicate the occurrence of one of said n times, said means



for silencing being operative only while said alarm means indicates the occurrence of one of said n times, thereby to prevent the accidental silencing of said alarm means before or between the occurrence of each of said n times.

4,490,712

INFORMATION TRANSCODING PROCESS AND A TRANSMISSION SYSTEM USING SUCH A PROCESS

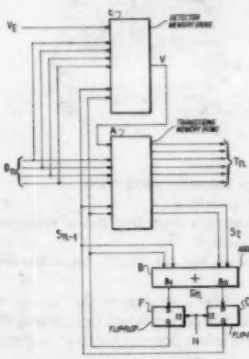
Claude Gourdon, and Jean Thivend, both of Conflans Ste Honorine, France, assignors to Lignes Telegraphiques et Telephoniques, Conflans Ste Honorine, France

Filed Jul. 27, 1981, Ser. No. 286,898

Claims priority, application France, Jul. 29, 1980, 80 16708

Int. Cl.³ H03K *13/00*

U.S. Cl. 340—347 DD **4 Claims**



1. A process for transcoding information to be transmitted over a transmission channel and expressed in a first code, comprising the steps of:

transforming information in the first code into a second code by choosing one of a plurality of alphabets capable of insuring such a transformation, said choosing being effected depending on the value of the current numerical sum, in accordance with a coding law whereby the value of said numerical sum is minimized;

receiving order track information;

detecting at least one possible value of the information to be transmitted, for which the coding law is altered depending on the value of said order track information;

outputting at one end of said transmission channel the information expressed in said second code which has been altered by said transmitted order track information;

transforming of the information received at the other end of said transmission channel into information expressed in said first code;

detecting of the order track by detecting said alterations in the coding law.

4,490,713

MICROPROCESSOR SUPERVISED ANALOG-TO-DIGITAL CONVERTER

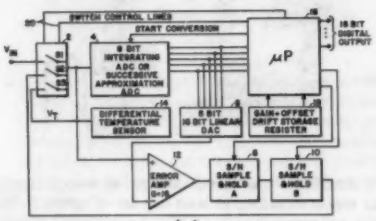
Andrij Mrozowski, and Paul R. Prazak, both of Tucson, Ariz., assignors to Burr-Brown Inc., Tucson, Ariz.

Continuation of Ser. No. 165,862, Jul. 7, 1980, abandoned, which is a continuation of Ser. No. 961,626, Nov. 11, 1978, abandoned.

This application Jun. 8, 1982, Ser. No. 386,428

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **1 Claim**



1. A microprocessor supervised analog-to-digital converter implemented to perform a recirculating remainder conversion of an analog input signal, comprising:

analog-to-digital conversion means for performing a first conversion of an analog signal into a digital representation;

a digital-to-analog converter having inputs connected to outputs of said conversion means for producing an analog voltage corresponding to said digital representation;

an error amplifier having a first input coupled to the output of said digital-to-analog converter and a second input coupled to said analog input signal to produce a remainder signal corresponding to the difference therebetween at the output of said error amplifier;

means for substituting said remainder signal for said analog signal to produce a second conversion by said conversion means resulting in the production of a second digital representation and a second remainder signal;

microprocessor means coupled to the outputs of said conversion means for receiving said digital representations simultaneously with the applicaton of said digital representations to said digital-to-analog converter for storing said digital representations and for computing therefrom a digital output corresponding to said analog input signal, said microprocessor means coupled to said substituting means and having means for controlling the number of conversions each of which produces a remainder signal and consequent digital representations thereof, said substituting means comprising:

first and second sample-and-hold circuits controlled by said microprocessor means and having inputs coupled to an output of said error amplifier for alternately receiving and storing successive remainder signals;

first switching means controlled by said microprocessor means for selectively coupling said analog input signal, said first sample-and-hold circuit and said second sample-and-hold circuit to said conversion means; and

second switching means for selectively coupling said analog input signal, said first sample-and-hold circuit and said second sample-and-hold circuit to said error amplifier;

means for producing a voltage indicative of termperature;

means coupled to said means for producing a voltage indicative of temperature and said conversion means for substituting said voltage for said analog input signal, said microprocessor means generating a digital representation of said

voltage to determine the amount of drift compensation to be applied to said digital output; and

first storage means coupled to said microprocessor means for storing, in digital form, amounts of drift compensation for various amounts of temperature change, said storage means containing the amount of gain and offset drift which occurs as a function of temperature change.

4,490,714

DIGITAL-TO-ANALOG CONVERTER FOR BIPOLAR SIGNALS

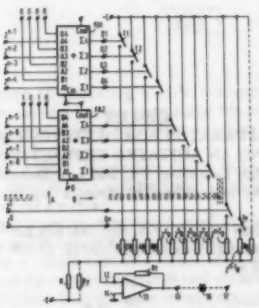
Rudy J. van de Plassche, and Eise C. Dijkmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 313,445, Oct. 21, 1981, abandoned. This application Feb. 6, 1984, Ser. No. 576,988

Claims priority, application Netherlands, May 7, 1981, 8102226

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **1 Claim**



1. A digital-to-analog converter for bipolar signals wherein the value of the most significant bit changes when the signal passes through the zero level, said converter comprising n inputs for n bits to be converted, at least n switches connected to the n inputs and which switch analog reference quantities to determine an analog value available on an output of the converter, means for eliminating the influence of switching transients on the analog value when the bits change in value, said means comprising a generator for generating a digital offset number, a binary adder connected between said inputs and said switches and to said generator for adding the digital offset number from said generator to the digital number to be converted, and an analog compensation source coupled to the output of said converter to compensate for the digital offset.

4,490,715

GAS DETECTOR

Shigekazu Kusanagi, Katano; Shigeo Akiyama, Kadoma; Tohru Nobutani, Osaka, and Hideo Kawamura, Neyagawa, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Sep. 14, 1981, Ser. No. 302,161

Claims priority, application Japan, Sep. 13, 1980, 55-127764; Nov. 21, 1980, 55-164891

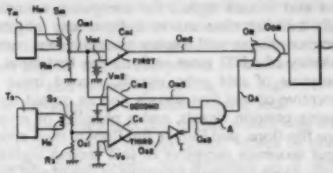
Int. Cl.³ G08B *17/10*

U.S. Cl. 340—634 **9 Claims**

1. A gas detector comprising:

a main signal processing unit, including a main gas sensing element showing a change in electric resistance value to both target and non-target gases and putting out a first alarm driving signal by detecting that the target and non-target gas exceeds a first specified level;

a sub-signal-processing unit including (1) a circuit unit to give a second alarm driving signal when the detected target and non-target gas exceeds a second specified level of concentration set lower than the first specified level, through the use of the main gas sensing element; and (2) a gate signal trigger unit for blocking the second alarm driving signal when the concentration of the non-target gas exceeds a third specified level, said gate signal trigger



unit comprising an auxiliary gas sensing element showing a change in electric resistance in response to particularly non-target gas and a gate circuit unit coupled to the auxiliary gas sensing element; and

an alarm triggering means that is actuated by receiving the first or second alarm driving signal.

4,490,716

ULTRASONIC DISTANCE DETECTOR

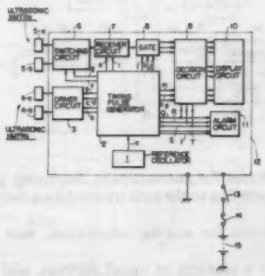
Tadashi Tsuda, Nagoya; Seiichirou Hiramatsu, Obbu; Tsuyoshi Maeno, and Mitsugi Ohtsuka, both of Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 13, 1981, Ser. No. 321,224

Claims priority, application Japan, Nov. 14, 1980, 55-160979

Int. Cl.³ G08G *1/00*

U.S. Cl. 340—904 **3 Claims**



1. An ultrasonic alarm system for detecting at least one object located with respect to a moving vehicle, comprising:

a first array of ultrasonic transmitting transducers for emitting ultrasonic energies in respective directivity patterns;

a second array of ultrasonic receiving transducers disposed alternatively with said ultrasonic transmitting transducers and actuatable in timed alternate relation to said ultrasonic transmitting transducers for receiving ultrasonic echoes reflected from any objects located in laterally overlapping detecting regions defined in said directivity patterns;

first means for sequentially energizing said ultrasonic transmitting transducers to emit the ultrasonic energies successively in said directivity patterns;

second means for sequentially receiving echo signals indicative of said ultrasonic echoes from said ultrasonic receiving transducers;

third means for generating first signals representative of sequential operations of said ultrasonic transmitting transducers;

fourth means for generating second signals of varying dura-

tions indicative of different distance ranges in each of said laterally overlapping detecting regions;

display means comprising a matrix of light-emitting elements; and

display control means responsive to said echo signals and said first signals for energizing rows of said light-emitting elements to indicate any objects in said laterally overlapping detecting regions and responsive to said echo signals and said second signals for energizing columns of said light-emitting elements to indicate any objects in said distance ranges, said display control means comprising:

a plurality of AND gates each having first input terminals receptive of said echo signals, second input terminals receptive of said first signals, and an output terminal for issuing position signals, and a plurality of groups of D-type flip-flops, said D-type flip-flops in each group having input terminals receptive of said second signals, respectively, clock terminals receptive of one of said first signals, and output terminals for issuing energization signals to one of said columns of said light-emitting elements.

4,490,717

GEOGRAPHIC DISPLAY DEVICE FOR A MOVING VEHICLE

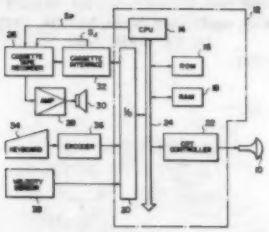
Takao Saito, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 9, 1982, Ser. No. 386,761

Claims priority, application Japan, Jun. 15, 1981, 56-91967

Int. Cl.³ G08G *1/12*; G11B *5/00*

U.S. Cl. 340—996 **11 Claims**



1. An apparatus for automatically displaying geographical charts corresponding to the path traveled by a moving vehicle, comprising:

memory means for storing information, said information including:

indicia of a plurality of visual patterns, said plurality of patterns depicting the geography of at least said path,

indicia of the position on said path of at least one check point, and

indicia of an audible request for a correction to a calculated position on said path of said vehicle;

travel distance sensing means for sensing the distance traveled by said vehicle;

position correction switching means, manipulatable by a user, for selectively generating a position correction signal;

pattern switching means, manipulatable by a user, for selectively generating a pattern switching signal;

audio producing means, responsive to said audible request indicia and to a first control signal, for producing the audible request corresponding to said audible request indicia;

control means, responsive to said sensed distance, said position correction signal, said pattern switching signal and said stored information, for:

calculating the position of said vehicle on said path from said sensed distance traveled;

selecting one of said plurality of patterns corresponding to said calculated position of said vehicle on said path and automatically changing said selection as said calculated position changes;

selecting one of said patterns different from the one corresponding to the calculated position of said vehicle in response to said pattern switching signal;

producing said first control signal when said calculated position corresponds to the stored position of said check point; and

correcting said calculated position according to said stored position in response to said position correcting signal; and

display means, connected to said control means, for displaying said selected pattern.

4,490,718

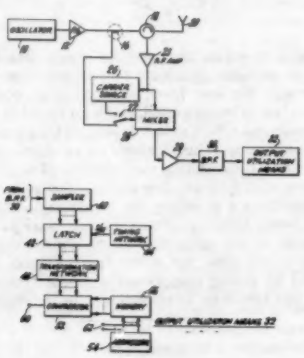
RADAR APPARATUS FOR DETECTING AND/OR CLASSIFYING AN AGITATED REFLECTIVE TARGET

Charles L. Opitz, Lancaster, Pa., and Leo Slobodin, Holmdel, N.J., assignors to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Nov. 6, 1975, Ser. No. 629,225

Int. Cl.³ G01S *13/00, 13/52, 13/58*

U.S. Cl. 343—5 SA **11 Claims**

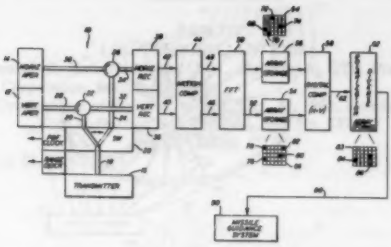


1. The method for detecting an agitated, reflected target of unknown type comprising the steps of radiating an interrogation wave of radio frequency energy, receiving any reflected energy signal, mixing said received reflected signal with a local oscillation comprising a replica of the frequency of the radiated wave to extract a band limited portion of said reflected signal in a fixed, predetermined frequency band adjacent to and not including the frequency after mixing of said radiated wave, and classifying the target type dependent upon the form of said extracted band limited signal, wherein said target classifying step comprises the steps of storing at least one reflected plural sample signal pattern each characterizing a distinct target type, comparing said extracted band limited signal with the at least one stored pattern, and providing an output indication upon detecting a match between said extracted band limited signal and one of said stored pattern.

4,490,719
POLARIZATION CONTROLLED MAP MATCHER MISSILE GUIDANCE SYSTEM

Leo Botwin, Westport, and Lester H. Kosowsky, Stamford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 27, 1981, Ser. No. 325,520
Int. Cl.³ G01S 13/06; F41G 7/20
U.S. Cl. 343—5 MM 1 Claim



1. A method of providing a H-V reference grid for the guidance system of a missile, comprising the steps of:

providing a radar with horizontal aperture and a vertical aperture;

switching alternate illuminating pulses from the transmitter of said radar first to said horizontal aperture and then to said vertical aperture;

providing a separate receiver channel for horizontal radar returns and for vertical radar returns;

generating a horizontal map from said horizontal radar returns and a vertical map from said vertical radar returns, each of which has said radar returns organized in an array corresponding to various ground locations;

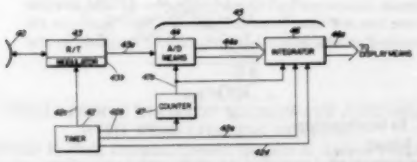
generating a polarization discriminant map by comparing on a pixel-by-pixel basis the location and intensity of radar returns in said vertical map with those in said horizontal map to identify only those returns which are colocated and have equal polarization intensity; and

feeding the polarization discriminant to the guidance system of the missile.

4,490,720
MULTIPULSE SIGNAL PROCESSING FOR RADAR SYSTEM

Daryal Kuntman, South Pompano Beach, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 30, 1981, Ser. No. 249,288
Int. Cl.³ G01S 7/28
U.S. Cl. 343—17.1 PW 3 Claims



1. A radar system comprising:

transmitting means for radiating relatively short duration radar pulses alternately with relatively long duration radar pulses into a field of interest;

a radar receiver for producing first discrete video signals during a first interpulse period immediately subsequent to the transmission of a relatively short duration radar pulse, said first discrete video signals corresponding to radar returns resulting from the transmission of said relatively short duration radar pulse, and for producing second discrete video signals during a second interpulse period immediately subsequent to the transmission of a relatively long duration radar pulse, said second discrete video signals corresponding to radar returns resulting from the transmission of said relatively long duration radar pulse;

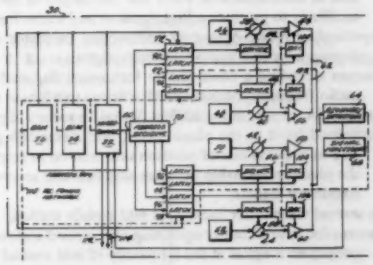
means for converting said first discrete video signals into first digital words comprised of elements of digital data and for converting said second discrete video signals into second digital words comprised of elements of digital data, each said element consisting of k digits representative of the amplitude of a video signal; and,

means for integrating said first digital words with the latter portion only of said second digital words to produce a composite digital word representative of a composite radar return signal for the entire effective range of said radar, said latter portion of said second digital words corresponding to radar returns from targets lying beyond a range relatively close to said transmitting means.

4,490,721
MONOLITHIC MICROWAVE INTEGRATED CIRCUIT WITH INTEGRAL ARRAY ANTENNA

Ronald J. Stockton, Nederland, and Robert E. Munson, Boulder, both of Colo., assignors to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 207,289, Nov. 17, 1980, abandoned.
This application Dec. 27, 1983, Ser. No. 565,516
Int. Cl.³ H01Q 3/26; H01P 3/08
U.S. Cl. 343—368 11 Claims



1. A monolithic integrated circuit antenna system, comprising:

at least two receiving array antenna elements, each of which includes a metallized resonant radiation element of approximately one-half wavelength dimension at an intended antenna operating frequency;

a phasing and r.f. feeding network connected to said antenna elements and including one or more FET devices associated with at least some some of said antenna elements for combining r.f. signals received by said antenna elements and for controlling an electrical phase shift associated with the r.f. signals coming from each of said receiving array elements; and

an integrated circuit controller means connected to each of said Fet devices for controlling said phasing and r.f. feeding network,

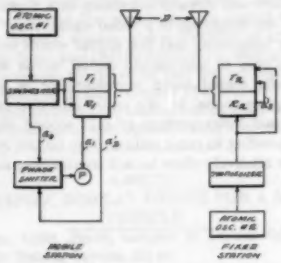
said array elements, phasing and r.f. feeding network and controller means all being integrated onto a single substrate of semi-insulating GaAs semiconductor material having a resistivity of about 10^7 to 10^9 ohm-cm.

4,490,722

RADIO NAVIGATION SYSTEM

William A. Rounios, Tabb, and Phillip R. Modlin, Hampton, both of Va., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Apr. 20, 1982, Ser. No. 370,070
Int. Cl.³ G01S 1/36
U.S. Cl. 343—394 3 Claims



1. A line-of-position navigation system for determining the position of a mobile station, comprising:

a first transmitter located at a fixed station and responsive to a first local oscillator for propagating a continuous wave at a first frequency;

a second local oscillator and a first receiver located at the mobile station, said second oscillator operating at a second frequency differing from that of the first oscillator by a frequency in the audio range, said receiver being responsive to the continuous wave and the output of the second oscillator to produce a first signal at said audio frequency;

synthesizer means joined to said second oscillator for producing a second audio frequency signal;

means including a phase shifter for connecting said second audio frequency signal as a first input to a phase meter;

means for connecting said first audio frequency signal as a second input to the phase meter, said meter being operative to provide line-of-position information in response to the phase relationship between said first and second audio frequency signals;

a second transmitter located at said mobile station;

means for intermittently operating said second transmitter to propagate a signal at the frequency of said second oscillator;

a second receiver located at said fixed station, said receiver being responsive to receipt of the output of said first oscillator and the signal propagated by the second transmitter to produce an audio frequency signal;

means for connecting said audio frequency signal produced by the second receiver to said first transmitter to produce a modulated signal having a carrier at the frequency of said first oscillator, said transmitter being operative to propagate, together with said continuous wave, a sideband of the modulated signal, said receiver means at the mobile station being responsive to said sideband to produce a third audio frequency signal at said mobile station;

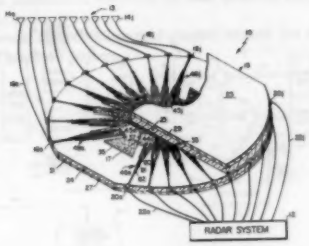
means for connecting said third audio frequency signal to said phase shifter, said phase shifter being operative during the intermittent periods of operation of the second transmitter to compare the phase relationships of said second and third audio frequency signals and to adjust the phase of the first input to the phase meter in response to any change in phase relationship occurring between said periods.

4,490,723

PARALLEL PLATE LENS ANTENNA

George S. Hardie, Santa Barbara; Raphael Hernandez, Oxnard, and Michael J. Maybell, Santa Barbara, all of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1983, Ser. No. 455,398
Int. Cl.³ H01Q 15/02
U.S. Cl. 343—754 6 Claims



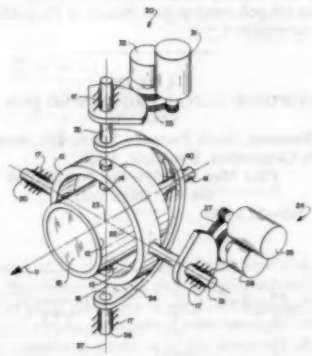
1. A radio frequency lens comprising: a plurality of lens ports disposed about a peripheral portion of such lens; each one of a first portion of adjacent ones of such plurality of lens ports including a plurality of tapered feeds; and a power divider/combiner coupled to each one of the adjacent ones of the plurality of lens ports, each one of such power divider/combiners having a plurality of branch lines coupled to the tapered feeds and a common line coupled to a port of the lens.

4,490,724

GIMBAL SYSTEM WITH CASE MOUNTED DRIVES

Bernard F. Bickman, Ramsey County, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 4, 1982, Ser. No. 405,216
Int. Cl.³ H01Q 1/12, 3/02
U.S. Cl. 343—765 2 Claims



1. In combination:

a frame;

an outer gimbal mounted in said frame for pivotal movement about a first axis;

an inner gimbal mounted in said outer gimbal for pivotal movement about a second axis orthogonal to said first axis;

a sensor having a longitudinal axis;

means mounting said sensor in said inner gimbal with said longitudinal axis orthogonal to said second axis;

means carried by said frame for causing rotation of said outer gimbal about said first axis;

and means carried in part by said frame and in part by said inner gimbal for causing rotation of said inner gimbal about said second axis, the last named means comprising a pin carried by said inner gimbal and aligned with said longitudinal axis, and an arcuate member pivoted in said frame about a third axis orthogonal to said first axis, and having a slot lying in a plane containing said third axis and receiving said pin, said axes intersecting at a common point and said slot being arcuate generally about said common point.

4,490,725

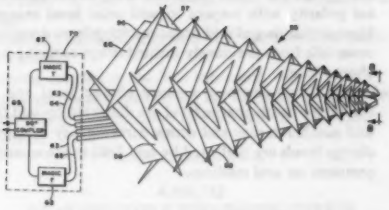
LOG-PERIODIC ANTENNA

Samuel C. Kuo, Saratoga, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 309,874, Oct. 19, 1981, abandoned. This application Sep. 29, 1983, Ser. No. 537,777

Int. Cl.³ H01Q *11/10*

U.S. Cl. 343—792.5 **16 Claims**



1. In a direction finding system, apparatus comprising first and second antennas, each of said antennas comprising:

a dielectric member having an axis and converging planar sides, the planes of adjacent sides being perpendicular and converging with said axis at an apex point;

an array of radiating elements; said array having an axis and comprising first and second sets of said elements that are arranged in a frequency independent manner; the elements of each of said sets being axially spaced and having dimensions and interelement spacings which decrease from a maximum at one end to a minimum at the other end in increments at a predetermined ratio; axially successive elements of each of said sets projecting in opposite directions from the associated axis;

the first and second sets of said array being mounted on associated ones of opposite sides of said member; and

balanced feed means for energizing said elements of said array so as to cause said antenna to have antenna patterns of a prescribed polarization;

the axes of said dielectric members of said first and second antennas forming an acute angle therebetween with the apex points thereof coinciding at a common point such that said first and second sets of elements of said first antenna (and on opposite sides of said associated member) are coplanar with associated ones of said first and second sets of elements of said second antenna and in E-planes.

4,490,726

COLLAPSIBLE ROOFTOP MICROWAVE ANTENNA WITH WIND LOADING FEATURE

Walter F. Weir, Ontario, Canada, assignor to Andrew Corporation, Orland Park, Ill.

Filed Jun. 3, 1982, Ser. No. 384,527

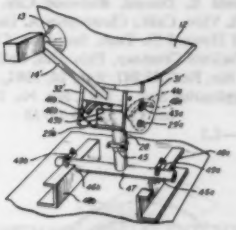
Int. Cl.³ H01Q *1/12*

U.S. Cl. 343—840 **9 Claims**

1. A reflector-type microwave antenna assembly adaptable for rooftop mounting, said antenna assembly comprising, in combination,

a parabolic reflector dish for receiving microwave signals and reflecting said signals into a waveguide, said reflector dish having a pair of generally parallel mounting ribs fastened to the backside thereof, and

an antenna mount including a mounting pad, a generally vertical post attached to and extending above said mounting pad, and a cross-head rotatably mounted on said vertical post and disposed between said pair of mounting ribs, said cross-head receiving a generally horizontal pivot bolt securing the cross-head between said mounting ribs, said cross-head having azimuthal locking means for fixing the angular position of the cross-head on said vertical post, a



pair of side flanges abutting respective ones of the mounting ribs, each of said side flanges having an arcuate slot generally centered about said pivot bolt, and means disposed within each of said arcuate slots for securing the mounting ribs to the respective side flanges when wind force tending to pivot said parabolic reflector about said pivot bolt is below a predetermined level, and for permitting limited pivoting of said parabolic reflector about said pivot bolt when said wind force exceeds said predetermined level, said limited pivoting being limited by the ends of said arcuate slots.

4,490,727

ADJUSTABLE TOP LOADED ANTENNA

Gilbert J. Kowols, Park Ridge, Ill., assignor to Mobile Mark, Inc., Franklin Park, Ill.

Filed Oct. 18, 1979, Ser. No. 85,937

Int. Cl.³ H01Q *1/36*

U.S. Cl. 343—895 **9 Claims**

1. A mobile antenna of the type having a dielectric rod on which conductive wire is helically wound to form a close wound loading coil along a portion of the length of the dielectric rod adjacent the upper end thereof, and a protective outer

jacket of insulating material covering the loading coil and extending along at least the major portion of the length of the dielectric rod, the improvement comprising, a dielectric sleeve mounted over said protective jacket on the upper end thereof, said dielectric sleeve being snugly mounted over said jacket but being slidable along said loading coil to adjust the antenna frequency.

4,490,728

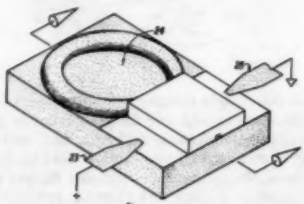
THERMAL INK JET PRINTER

John L. Vaught, Palo Alto, Calif.; Frank L. Cloutier, Corvallis, Oreg.; David K. Donald, Redwood City, Calif.; John D. Meyer, Mt. View, Calif.; Christopher A. Tacklind, Palo Alto, Calif., and Howard H. Taub, San Jose, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 292,841, Aug. 14, 1981, abandoned. This application Sep. 7, 1982, Ser. No. 415,290

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—1.1 **4 Claims**



1. A method of ejecting a droplet of liquid from an orifice in a liquid-containing capillary, comprising the steps of:

heating a portion of said liquid to a temperature which is below the boiling point of the liquid by passing an electrical precurser current pulse, which varies substantially as the square root of the inverse of time, through a resistor which is in thermal contact with said portion; and

quickly heating said portion, by passing a subsequent electrical nucleation current pulse through the resistor, to a temperature above the boiling point of the liquid and near the superheat limit of the liquid to cause formation of a vapor bubble in said liquid-containing capillary, said vapor bubble causing a droplet of liquid to be ejected from said orifice.

4,490,729

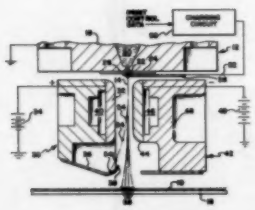
INK JET PRINTER

Frederic L. Clark, Plano, and David B. Wallace, Dallas, both of Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Sep. 15, 1982, Ser. No. 418,363

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **20 Claims**



1. An ink jet printer for depositing drops of ink at a plurality of print positions on a moving print receiving medium, comprising:

print head means for producing at least one jet drop stream of drops directed toward a moving print receiving medium,

charge electrode means positioned adjacent the point of drop formation of said jet drop stream,

catcher means for catching drops which are not to be deposited on said medium,

deflection field means for providing an electric field through which drops in said jet drop stream pass, and

charging means for repetitively applying a relatively high guard drop potential to said charge electrode during formation of at least every second drop for charging of said at least every second drop to a guard charge level, and, during formation of the remainder of said drops, selectively applying to said charge electrode either one of a number of relatively low print potentials for bipolar charging of said remainder of said drops to an associated one of a number of relatively low print charge levels, or a substantially larger catch potential for charging of said remainder of said drops to a catch charge level, said guard drop, print and catch potentials being of the same electrical polarity with respect to said print head means, and bipolar charging of said drops resulting from drop-to-drop cross talk from previously formed drops carrying a guard charge level,

whereby drops carrying a guard charge level and drops carrying a catch charge level are deflected by said field to said catcher means and drops carrying any of said print charge levels are deflected by said field to associated print positions on said medium.

4,490,730

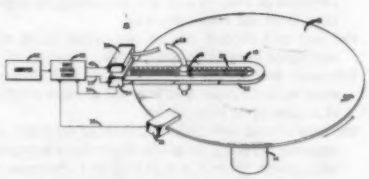
PULSED OPTICAL STORAGE SYSTEM

Douglas G. Youmans, Watertown, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Oct. 28, 1982, Ser. No. 437,123

Int. Cl.³ G01D *15/10, 9/42;* **G11B** *7/00*

U.S. Cl. 346—76 L **9 Claims**



1. A pulsed optical storage system comprising:

rotatable storage means;

means for projecting a beam of radiation at the surface of said storage means;

means for moving said means for projecting transversely relative to the surface of said storage means;

means for sensing the position of said means for projecting relative to said storage means;

a radiation source for providing radiation to said means for projecting, including a radiation element and a switching circuit in close proximity to said radiation element for selectively de-energizing said radiation element; and

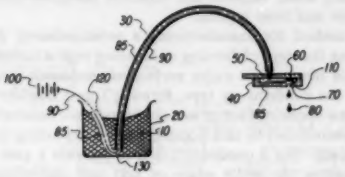
a control circuit responsive to said means for sensing for selectively enabling said switching circuit to energize said radiation element to produce pulses of radiation to said means for projecting.

4,490,731

INK DISPENSER WITH "FROZEN" SOLID INK

John L. Vaught, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 22, 1982, Ser. No. 443,410
Int. Cl.³ G01D 15/16
U.S. Cl. 346—140 R 10 Claims



1. An apparatus for dispensing ink which is a solid at 25° C. from a reservoir onto a recording media, said apparatus comprising:

a feed tube having an entrance in contact with the ink in the reservoir;

a nozzle coupled to the feed tube; and

a resistance heater for melting the ink, said resistance heater extending from the reservoir through the feed tube to the nozzle.

4,490,732

HEAT-SENSITIVE RECORDING SHEETS

Masakazu Maekawa, and Yasuhiro Ogata, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 22, 1982, Ser. No. 436,083
Claims priority, application Japan, Oct. 22, 1981, 56/169035
Int. Cl.³ B41M 5/22
U.S. Cl. 346—200 8 Claims

1. A heat-sensitive recording sheet, comprising:

a base paper having a density of 0.9 g/cm³ or less; and

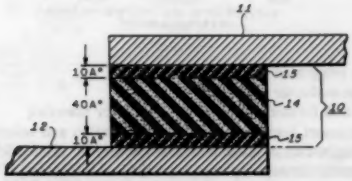
a heat-sensitive color forming layer coated on the surface of the base paper, the optical contact ratio of the surface of the base paper being at least 15%.

4,490,733

JOSEPHSON DEVICE WITH TUNNELING BARRIER HAVING LOW DENSITY OF LOCALIZED STATES AND ENHANCED FIGURES OF MERIT

Harry Kroger, Sudbury, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Oct. 15, 1982, Ser. No. 434,791
Int. Cl.³ H01L 45/00, 27/12, 39/22, 49/02
U.S. Cl. 357—5 16 Claims



1. A superconducting tunnel junction device comprising:

(a) first and second layers of superconductive material superposed with respect to each other,

(b) barrier means fabricated by deposition in a gaseous atmosphere superposed between said first and second superconductive layers whereby tunneling current can flow therethrough between said superconductive layers, and

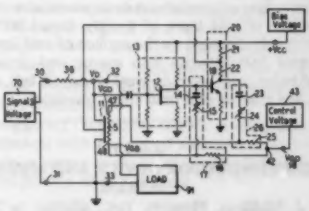
(c) said barrier means including semiconductive material with a portion having a substantially reduced density of localized states so as to minimize leakage current through said barrier, and a portion of said barrier means at the interface with at least one of said first and second superconductive layers with a normal density of localized states.

4,490,734

VARIABLE IMPEDANCE CIRCUIT EMPLOYING AN RIS FIELD EFFECT TRANSISTOR

Takaaki Yamada, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 105,497, Dec. 20, 1979, abandoned, which is a continuation of Ser. No. 719,403, Sep. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 358,168, May 7, 1973, abandoned. This application Feb. 17, 1982, Ser. No. 349,454
Claims priority, application Japan, May 13, 1972, 47-47578; Jun. 20, 1972, 47-72980; Apr. 6, 1973, 48-39208
Int. Cl.³ H01L 29/78
U.S. Cl. 357—23 3 Claims



1. A variable impedance circuit comprising a field effect transistor formed from a substrate in which a source and a drain region are formed, an insulating layer formed on said substrate between said source and drain, a resistive gate layer formed on said insulating layer between said source and drain, a first gate electrode connected to a first end of said resistive gate layer which is near said source, a second gate electrode connected to a second end of said resistive gate layer which is near said drain, a back gate electrode connected to said substrate of said field effect transistor, a voltage source connected to said back gate electrode, a first phase inverter connected to said drain, a first adder circuit including a first variable resistor connected to said first phase inverter, a control voltage source connected to said first adder and the output of said first adder connected to said second gate electrode, a second phase inverter and amplifier circuit connected to the output of said first phase inverter circuit, a second adder circuit including a second variable resistor connected to said second phase inverter circuit, the output of said second adder and said control voltage source connected to said first gate electrode, a load connected across said source and drain, and an input voltage connected across said source and drain.

4,490,735

MONOLITHIC INPUT STAGE OF AN OPTICAL RECEIVER

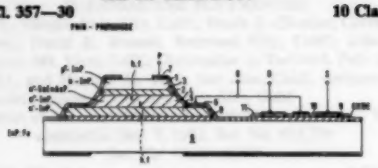
Bernhard Schwaderer, Weimach i. T., Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 31, 1982, Ser. No. 413,231

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1981, 3135462

Int. Cl.³ H01L *27/14*

U.S. Cl. 357—30 **10 Claims**



1. A monolithically integrated input circuit for an optical receiver comprising a PNIN photodiode connected to a field effect transistor and wherein:

said photodiode includes a first semiconductor layer of n-type GaInAsP forming an absorption zone for the optical radiation, a second and third adjacent semiconductor layers of InP of opposite conductivity types and forming a pn junction at their interface with said second layer being on one major surface of said first layer and with the other major surface of said first layer being disposed on one major surface of a carrier;

said carrier includes a semi-insulating InP substrate having a layer of weakly doped InP of one conductivity type on one of its major surfaces, with said layer of weakly doped InP forming said one major surface of said carrier and said carrier being common to both said photodiode and said field effect transistor; and

said field effect transistor is formed on a portion of said one surface of said carrier adjacent said photodiode and includes spaced source and drain electrodes contacting the surface of said layer of weakly doped InP, and a gate electrode disposed on the surface of said layer of weakly doped InP between said source and drain electrodes, whereby said layer of weakly doped InP serves as the active zone of said field effect transistor.

4,490,736

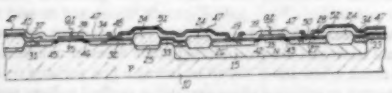
SEMICONDUCTOR DEVICE AND METHOD OF MAKING

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 032,597, Apr. 23, 1979, Pat. No. 4,213,142, which is a continuation of Ser. No. 797,273, May 16, 1977, abandoned, which is a division of Ser. No. 573,696, May 1, 1975, Pat. No. 4,061,506. This application May 19, 1980, Ser. No. 151,082

Int. Cl.³ H01L *29/02, 21/265*

U.S. Cl. 357—41 **10 Claims**



1. An integrated circuit device having insulated gate field effect transistors comprising:

(a) a silicon substrate,

(b) a tank region formed in a face of said substrate,

(c) a first surface area of said face spaced from the tank region for inclusion of a first transistor,

(d) a second surface area of said face within the tank region for inclusion of a second transistor,

(e) first and second conductive gates overlying thin gate insulator on said first and second surface areas, respectively,

(f) source and drain regions in said face at the first surface area on opposite sides of the first gate,

(g) source and drain regions in said face at the second surface area on opposite sides of the second gate,

(h) and self aligned implanted regions in said first and second surface areas, respectively, adjacent the gates and said source and drain regions.

9. A method for manufacturing a semiconductor device comprising the steps of forming an isolating region including a field oxide film on one major surface of semiconductor substrate of one conductivity type, forming a gate insulator film on said one major surface of said semiconductor substrate at a position surrounded by said isolating region, depositing on said gate insulator film a conductive film to provide a gate electrode, shaping the width edges of said gate electrode, and thereafter introducing impurities of said one conductivity type into said semiconductor substrate between the width edges of said gate electrode and said field oxide film opposed thereto to form a channel stopper region so thata boundary line of said channel stopper region is substantially in coincidence with said width edge of said gate electrode in the plane view.

4,490,737

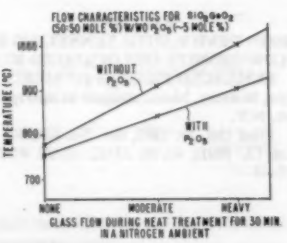
SMOOTH GLASS INSULATING FILM OVER INTERCONNECTS ON AN INTEGRATED CIRCUIT

John M. Pierce, Palo Alto, and William I. Lehrer, Los Altos, both of Calif., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Continuation-in-part of Ser. No. 243,988, Mar. 16, 1981, abandoned. This application Mar. 26, 1982, Ser. No. 362,322

Int. Cl.³ H01L *23/30, 29/34;* C03C *3/04*

U.S. Cl. 357—73 AJJ **6 Claims**



1. An integrated circuit comprising:

a semiconductor material;

insulation formed on said semiconductor material;

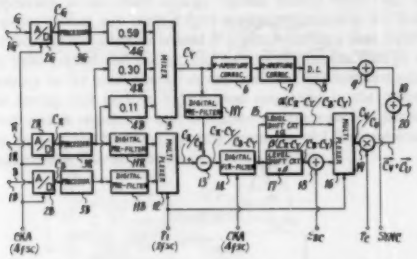
interconnect leads formed on said insulation and selectively brought into contact with the underlying semiconductor material through openings in said insulation; and

a glass layer formed on said interconnect leads, said glass layer consisting of about 45% to 50% SiO_2, about 50% to 45% of GeO_2 and from 1% to about 5% of P_2O_5, by mole percent, said glass layer having a flow temperature sufficiently low to prevent damage to said leads and being capable of flowing over said leads at said flow temperature to provide a smooth glass layer surface.

4,490,738
DIGITAL COLOR CAMERA

Takashi Asaida, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 24, 1982, Ser. No. 391,710
Claims priority, application Japan, Jun. 26, 1981, 56-99867
Int. Cl.³ H04N 9/09
U.S. Cl. 358—50 12 Claims

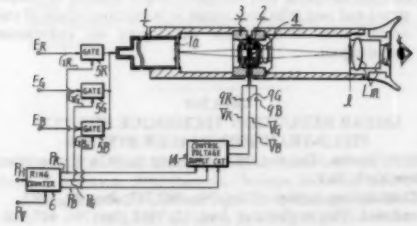


1. A digital color camera comprising, means for generating first, second and third digital color signals each at a rate of $4f_{sc}$ (where f_{sc} represents the color subcarrier frequency) from outputs of first, second and third imagers, means for forming a digital luminance signal from said first, second and third digital color signals, means for forming a dot-sequential color difference signal in which first and second digital color difference signals appear alternately every $1/4f_{sc}$ from said first, second and third digital color signals, and digital filter means receiving said dot-sequential digital color difference signal so as to limit the band widths of said first and second digital color difference signals.

4,490,739
COLOR IMAGE REPRODUCING APPARATUS

Masami Himuro; Susumu Nishigaki, and Kazuhiko Terunuma, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 302,707, Sep. 16, 1981, abandoned. This application Oct. 3, 1983, Ser. No. 538,777
Claims priority, application Japan, Sep. 19, 1980, 55-131040
Int. Cl.³ H04N 9/22
U.S. Cl. 358—66 21 Claims

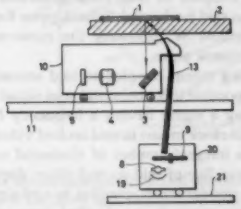


1. Apparatus for reproducing a color image comprising:
means for producing a black and white image in response to a color video signal supplied thereto;
a plurality of color filter means, each adapted to transmit light of only one color; and
shutter means which is stationary with respect to said plurality of color filter means for permitting the transmission of light from said black and white image only through selected ones of said color filter means to a predetermined position in correspondence with the supply of said color video signal to said means for producing a black and white image.

4,490,740
STATIONARY PLATEN TYPE MULTICOLOR ORIGINAL READING DEVICE

Fujio Moriguchi, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1982, Ser. No. 409,001
Claims priority, application Japan, Aug. 18, 1981, 56-128175
Int. Cl.³ H04N 1/46
U.S. Cl. 358—75 10 Claims

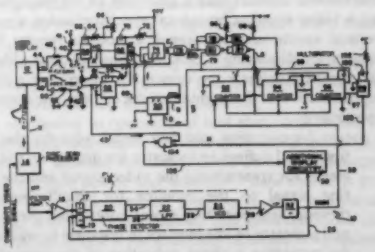


1. A stationary platen type multicolor reading device comprising:
a platen on which an original is placed;
an illuminating light source section for periodically and selectively outputting monochromatic illuminating light of different hues;
light guides having light input ends confronting said illuminating light source section and light output ends confronting a reading section of said platen;
a photo-electric reading element for receiving that light emitted from said output ends of said light guides which is reflected from said original on said platen;
said light output ends of said light guides and said photo-electric reading element being mounted on a scanner wherein said scanner is movable incrementaliy with respect to said platen; and
means for triggering said photo-electric reading element in synchronization with the period selection of said illuminating light to output as electrical signals the images of an illuminated portion of said original.

4,490,741
SYNCHRONIZATION SIGNAL STABILIZATION FOR VIDEO IMAGE OVERLAY

Donald L. Hornback, St. Joseph, Mich., assignor to Heath Company, St. Joseph, Mich.

Filed Oct. 8, 1982, Ser. No. 433,343
Int. Cl.³ H04N 5/04, 5/12
U.S. Cl. 358—152 13 Claims



1. A system for synchronizing the horizontal scan H' of a

second video display with the horizontal scan H of a first video display for superimposing a second image presented by said second video display on a first image presented by said first video display wherein said second video display includes clock means responsive to a synthesized clock signal for generating an image having an integer number N of elemental areas in each horizontal scan line and wherein said first and second images are respectively comprised of first and second interleaved horizontal scan fields, said system comprising:

pulse detection means coupled to said second video display for detecting a horizontal flyback pulse occurring at the beginning of said second horizontal scan field of said first video display;

timing means coupled to said pulse detection means and responsive to said horizontal flyback pulse for generating a timing window W following the occurrence of said horizontal flyback pulse;

signal processing means coupled to said second video display and responsive to a horizontal scan signal NH therein for generating a signal having a frequency NMH phase locked to said clock means in said second video display for providing an integral number of elemental areas in each horizontal scan line of said second video display;

programmable divider means coupled to said signal processing means for generating a divided-down synchronous horizontal scan signal; and

detector means coupled to said timing means and said programmable divider means for detecting when said divided-down synchronous horizontal scan signal occurs outside of said window for generating a correction signal and providing said correction signal to said programmable divider means;

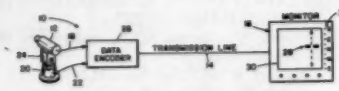
wherein said programmable divider means is coupled to said first video display for time aligning said synchronous horizontal scan signal with said correction signal and providing a resultant synchronous signal to said second video display for synchronizing the horizontal scan thereof with that of said first video display.

4,490,742

ENCODING APPARATUS FOR A CLOSED CIRCUIT TELEVISION SYSTEM

Richard E. Wurtzinger, Oak Park, Ill., assignor to VCS, Incorporated, Carol Stream, Ill.

Filed Apr. 23, 1982, Ser. No. 371,198
Int. Cl.³ H04N 5/26
U.S. Cl. 358—183 **9 Claims**



1. In a closed circuit television system having a camera of controllable azimuth which generates an output signal including a video signal, a horizontal synchronization signal, and a vertical synchronization signal, a monitor remote from said camera for displaying a picture defined by said video signal, and means proximate the camera for generating a first signal representative of the azimuth of the camera, the improvement comprising:

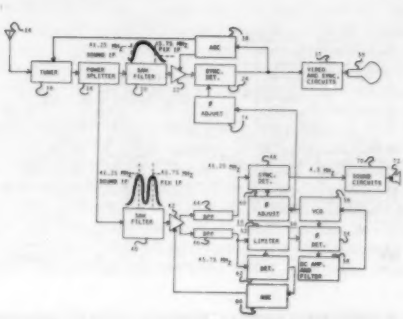
means for encoding said first signal whereby the encoded first signal defines an indicator for display on the monitor; means for transmitting the video signal and the encoded first signal to the monitor for simultaneous display thereon, said encoding means controlling the position of said indicator on the monitor in response to said first signal for providing a visual indication of the azimuth of said camera.

4,490,743

INTERCARRIER SIGNAL DETECTION CIRCUIT FOR A TELEVISION RECEIVER

Victor Mycynek, Des Plaines, and Jouke N. Rypkema, Lombard, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed May 17, 1982, Ser. No. 378,569
Int. Cl.³ H04N 5/44, 5/62
U.S. Cl. 358—197 **13 Claims**



1. In a television receiver having a tuner responsive to a received television signal for developing an IF signal including a sound IF component comprising a frequency modulated sound carrier and a picture IF component comprising an amplitude modulated picture carrier, an improved sound processing circuit comprising:

filter means receiving said IF signal for developing a single filtered IF output signal comprising a representation of said sound IF component symmetrically processed about said sound carrier and a representation of said picture IF component symmetrically processed about said picture carrier;

means for controllably amplifying said single filtered IF output signal;

automatic gain control means responsive to said amplified single filtered IF output signal for controlling the gain of said amplifying means;

signal generating means responsive to said amplified single filtered IF output signal for generating a substantially unmodulated reference signal having a frequency substantially equal to said picture carrier;

a synchronous detector; and

means for coupling said amplified single filtered IF output signal and said reference signal to respective inputs of said synchronous detector for developing an intercarrier sound signal.

4,490,744

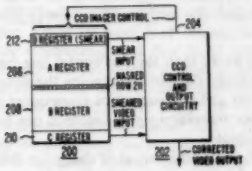
SMEAR REDUCTION TECHNIQUE FOR CCD FIELD-TRANSFER IMAGER SYSTEM

Peter A. Levine, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 393,733, Jun. 30, 1982, abandoned. This application Aug. 13, 1982, Ser. No. 407,926
Int. Cl.³ H04N 3/14
U.S. Cl. 358—213 **10 Claims**

1. In a field-transfer CCD imager system comprising a CCD imager for deriving a video signal output from an image projected on said imager, said imager being of a type which includes (1) a photosensing A register for integrating said projected image during a first portion of each of successive field periods to produce a charge pattern of pixels arranged in rows and columns during an integration portion of a field period, (2) a masked B register to which the entire charge pattern is transferred in the column direction during a second portion of each

of said successive field periods and while said A register remains unmasked, said transfer causing any bright spot of said projected image to produce a smear charge in said column direction, with a first part of that smear charge being transferred to said B register and a second part of that smear charge remaining in said A register, and (3) a masked line register into which the charge pattern stored in the B register is shifted, at most a row at a time, and from which pixel charge signals are shifted in serial fashion, during said first portion of each successive field period, whereby the first part of any smear charge appearing in the pixel charge signals shifted from said line register during any certain field period originates in the transfer from said A register to said B register during a first particular field period and the second part of any smear charge appearing in the pixel charge signals shifted from said line register during that certain field period originates in the transfer from said A register to said B register during a second particular field period that immediately precedes said first particular field period; the improvement:



wherein said CCD imager includes a masked line register situated at one end of said A register, which second-mentioned line register can be loaded, during said second portion of each field period, with solely smear charge that appears during that field period in respective columns of said A register, and which smear charge stored in said loaded second-mentioned line register can be serially shifted out during a certain time interval within each successive field period, and

wherein said CCD imager system further comprises means including said second-mentioned line register and responsive to said pixel charge signals shifted from said first-mentioned line register for at least substantially reducing the amounts of both the first and second parts of smear charge that appear in said video signal output during each successive field period, despite any movement in the row direction of the position of any image bright spot during the time interval of a field period that exists between successive transfers of charge pattern from said A register to said B register.

4,490,745

ILLUSION CREATING VISUAL DISPLAY DEVICE

Erick E. Erickson, 3912 Osceola, Chicago, Ill. 60634, and Daniel A. Langlois, 345 Fullerton, Apt. 2504, Chicago, Ill. 60614

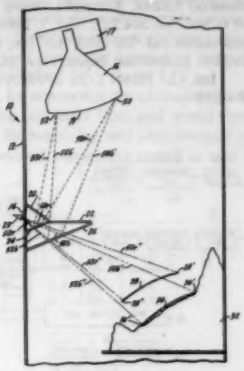
Filed Jul. 26, 1982, Ser. No. 402,143
Int. Cl.³ G02B 1/00; H04N 5/64
U.S. Cl. 358—250 **14 Claims**

1. An optical viewing device for producing an illusory image comprising:

a cathode ray tube capable of emitting at least a first red and at least a second blue signal of light,

a plurality of mirrors arranged such that said light source may be viewed along at least a first and at least a second separate reflected path wherein said first and second paths are of different lengths,

a red filter means interposed in said first one of said paths capable of passing one of said separable signals,



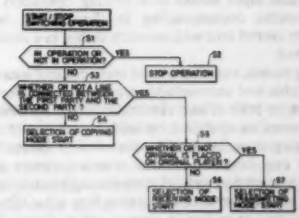
a blue filter means interposed in said second one of said paths capable of blocking said first one of said signals and passing the second said signals.

4,490,746

IMAGE INPUT/OUTPUT DEVICE

Haruhiko Moriguchi, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1982, Ser. No. 407,851
Claims priority, application Japan, Aug. 14, 1981, 56-126832
Int. Cl.³ H04N 1/32
U.S. Cl. 358—286 **5 Claims**



1. An input/output system comprising:

a multi-mode device having an operation panel and a start/-stop switch;

a controlling computer having a central processing unit, a read-only memory, a random access memory and a bus line for transmitting data therebetween;

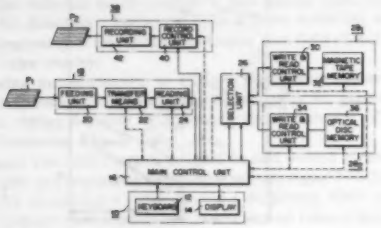
means responsive to operation of said start/stop switch for determining whether or not said multi-mode device is in operation, whether said multi-mode device is connected to an external device and whether a data source is provided at a predetermined position in said multi-mode device, wherein in response to said determinations said multi-mode device is automatically operated in a predetermined mode.

4,490,747

APPARATUS FOR FILING PICTURE INFORMATION

Makoto Yokoyama, Atsugi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 204,911, Nov. 7, 1980, abandoned. This application Jul. 15, 1983, Ser. No. 513,956
Claims priority, application Japan, Nov. 16, 1979, 54-147656
Int. Cl.³ H04N 1/28, 5/78, 5/85
U.S. Cl. 358—296 7 Claims



1. A document filing apparatus for filing system picture information comprising:

input means for scanning an original document to produce picture information corresponding to a pattern of said document;

main control means, connected to said input means, for receiving from said input means and temporarily storing said picture information;

rewritable memory means, having a previously non-written memory area and a previously written area into which can be written data including at least index information corresponding to the picture information;

unrewritable memory means, having a previously non-written area into which data can be written;

input/output means, connected to said main control means, for (a) specifying said rewritable memory means to change data previously written into said previously written memory area to update data or to write data into said previously non-written memory area and (b) specifying said unrewritable memory means to write in data that is to be permanently written therein, and (c) specifying index information corresponding to the picture information from said input means in a writing operation and index information corresponding to the picture information already stored into said memory means in a reading operation; and

selecting means, coupled to said main control means and said rewritable and unrewritable memory means, for (a) selecting one or both of said rewritable and unrewritable memory means as specified by said input/output means, (b) supplying data from said main control means to said selected one or both of said memory means during the writing operation and (c) transferring picture information from the selected memory means into which it was previously stored to said main control means during the reading operation.

4,490,748

METHOD AND APPARATUS FOR ONE LINE DROPOUT COMPENSATION OF COLOR TELEVISION SIGNALS

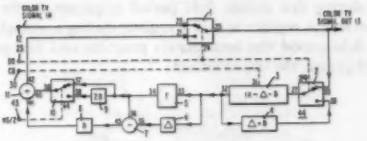
Bantval Y. Kamath, San Carlos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 285,894, Jul. 23, 1981, abandoned, which is a continuation of Ser. No. 133,042, Mar. 24, 1980, abandoned. This application Feb. 3, 1983, Ser. No. 463,181
Int. Cl.³ H04N 9/491, 5/94
U.S. Cl. 358—314 13 Claims

8. A method of compensating an input color television signal for dropouts by replacing said dropouts with previously occurring portions of the input color television signal not containing dropouts, the input color television signal having consecutive horizontal lines of video information including luminance and chrominance components, each horizontal line of a selected horizontal line interval, the chrominance component modulated on a carrier signal of known frequency; the steps comprising:

transmitting the luminance and chrominance components of the input color television signal not containing dropouts of each horizontal line of said input color television signal through a delay to provide a first interval of delay for the luminance component and a second interval of delay for the chrominance component;

adjusting the first interval of delay for different horizontal lines of the input color television signal to times greater



than and lesser than the horizontal line interval to maintain any phase difference between the delayed luminance component and the luminance component included in the input color television signal less than one half cycle of the carrier signal;

adjusting the second interval of delay for different horizontal lines of the input color television signal to times greater than and lesser than the horizontal line interval to maintain phase coherence between the delayed chrominance component and the chrominance component included in the input color television signal; and

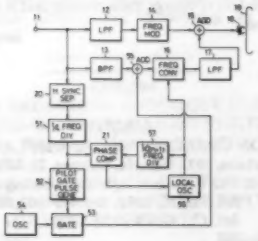
inserting the delayed luminance and chrominance components in the input color television signal in place of a dropout occurring therein.

4,490,749

COLOR VIDEO SIGNAL RECORDING AND/OR REPRODUCING SYSTEM

Akira Hirota, Chigasaki, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Nov. 19, 1981, Ser. No. 322,974
Claims priority, application Japan, Nov. 22, 1980, 55-165056; Nov. 22, 1980, 55-165057
Int. Cl.³ H04N 9/493
U.S. Cl. 358—320 3 Claims



1. A color video signal recording system comprising:

first filter means for separating a luminance signal from a color video signal;

modulator means for frequency-modulating said luminance signal;

second filter means for separating a carrier chrominance signal from said color video signal;

first frequency converting means for converting the frequency band of the carrier chrominance signal to a frequency band which is lower than frequencies occupied by the luminance signal output of said modulator means;

superimposing means for superimposing the output of said modulator means and the output of said first frequency converting means;

recording means for recording the output of the first superimposing means onto a magnetic recording medium;

first separation means for separating a horizontal synchronizing signal from said color video signal;

first frequency-converting signal forming means for forming a frequency-converting signal responsive to the horizontal synchronizing signal which is separated in said first separation means, the frequency-converting signal being supplied to said first frequency converting means, said first frequency-converting signal forming means comprising a first local oscillator means for supplying the frequency-converting signal to said first frequency converting means, first frequency dividing means for frequency-divding the output of said first local oscillator, first phase comparing means for comparing the phases of said separated horizontal synchronizing signal and said frequency-divided output signal of said first frequency dividing means and for controlling said first local oscillator by supplying an error output signal produced by said first phase comparing means, and second frequency dividing means for frequency-dividing the frequency of said separated horizontal synchronizing signal into $\frac{1}{n}$ the original frequency and for supplying the frequency-divided signal to said phase comparing means, the frequency-dividing ratio of said first frequency dividing means being $1/(2n+1)$ where n is an integer;

generating means for generating a reference frequency signal;

pilot gate pulse generating means for generating a pilot gate pulse from the output of said second frequency dividing means;

gating means responsive to said pilot gate pulse for gating said generated reference frequency signal; and

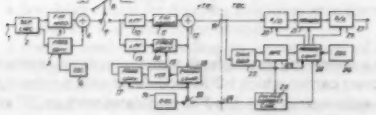
means for superimposing said gated signal as a pilot signal into the carrier chrominance signal which is separated in said second filter means.

4,490,750

APPARATUS FOR REPRODUCING A VIDEO SIGNAL

Tadaaki Yoshinaka, Hadano, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 313,158, Oct. 20, 1981, abandoned.
This application Mar. 8, 1984, Ser. No. 585,638
Claims priority, application Japan, Oct. 20, 1980, 55-146513
Int. Cl.³ H04N 9/493
U.S. Cl. 358—320 **4 Claims**



1. Apparatus for reproducing a video signal composed of a chrominance signal and a luminance signal, and which may contain jitter, comprising:

means for separating a first chrominance signal and a first luminance signal from the reproduced video signal, said first chrominance signal and said first luminance signal each containing said jitter in their respective subcarriers;

first converting means for connverting said first chrominance signal into a low frequency chrominance signal;

second converting means for converting said low frequency chrominance signal into a high frequency chrominance signal in response to a reference signal containing the same jitter as the subcarrier of said first chrominance signal;

means for demodulating said first luminance signal;

means for mixing the demodulated luminance signal and said high frequency chrominance signal to form a mixed signal;

time base correction means for removing jitter from said mixed signal, including

separating means for separating the chrominance subcarrier signal containing said jitter from said mixed signal; and

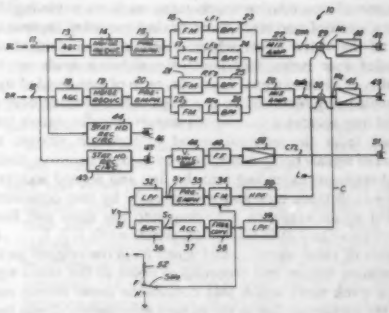
supplying means for supplying said chrominance subcarrier signal to said second converting means as said reference signal.

4,490,751

APPARATUS FOR RECORDING AND/OR REPRODUCING VIDEO AND AUDIO SIGNALS

Takashi Kono, Hachiouji; Shinji Kakuyama, Higashimurayama, and Toshimitsu Kamai, Higashikurume, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,875
Claims priority, application Japan, Dec. 11, 1981, 56-199755
Int. Cl.³ H04N 9/493
U.S. Cl. 358—330 **32 Claims**



1. A video and audio signal recording apparatus comprising:

frequency-modulating means for modulating first and second carriers by a first audio signal to be recorded and thereby providing first and second FM audio signals, respectively, and for modulating third and fourth carriers by a second audio signal to be recorded and thereby providing third and fourth FM audio signals, respectively, said first, second, third and fourth carriers having different respective frequencies;

first mixing means for mixing, with a video signal, two of said FM audio signals which represent said first and second audio signals to be recorded, respectively, and thereby providing a first mixed audio and video signal;

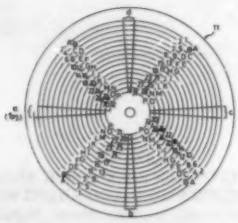
second mixing means for mixing the other two of said FM audio signals with said video signal and thereby providing a second mixed audio and video signal; and

first and second magnetic heads having different azimuth angles and respectively receiving said first and second mixed audio and video signals from said first and second mixing means for recording said first and second mixed signals in respective record tracks which are adjacent each other on a magnetic record medium.

4,490,752
ROTARY RECORDING MEDIUM HAVING A SELECTIVELY REPRODUCIBLE CONTINUOUS STREAM OF AUDIO SIGNALS RECORDED THEREON AND REPRODUCING APPARATUS THEREFOR

Toyotaka Machida, Kashiwa, and Hitoshi Aoike, Nagareyama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 31, 1982, Ser. No. 363,795
Claims priority, application Japan, Apr. 1, 1981, 56-48925; Apr. 1, 1981, 56-48926
Int. Cl.³ H04N 5/76
U.S. Cl. 358—342 11 Claims

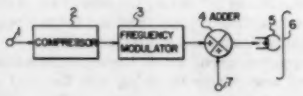


1. A rotary recording medium having a spiral track formed on a recording surface thereof, said spiral track having both video and audio signals recorded thereon, said signals being selectively transformed from a source of material on which mutually corresponding original picture and sound information streams are laid out, said spiral track being made up of a plurality of consecutive track turns each turn having four sectors, each of said track turns having recorded thereon one field of the video signal which is repeatedly and identically recorded four times, said audio signal being made up of a plurality of divided signal segments, each of said divided signal segments being recorded on one track turn extending over one of said four sectors, a continuous stream of audio signals transformed from the original sound information stream, said stream of signals being constituted by two consecutive divided signal segments extending into the first and second sectors on a (2n+1)-th track turn and subsequently by two consecutive divided signal segments extending into the third and fourth sectors on a (2n+2)-th track turn, where n=0, 1, 2, 3, . . . , and a stream of video signals transformed from the original picture information stream and recorded as fields of the video signal on the track parts which said continuous audio stream occupies, the picture motion in the picture information stream being substantially the same as an original picture motion of the original picture information stream in said source material.

4,490,753
AUDIO SIGNAL RECORDING AND REPRODUCING CIRCUIT

Shigeyuki Ito, Yokohama, and Yoshizumi Watatani, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1982, Ser. No. 350,588
Claims priority, application Japan, Feb. 23, 1981, 56-24314
Int. Cl.³ H04N 5/782
U.S. Cl. 360—19.1 7 Claims



1. An audio signal recording and reproducing system which records an audio signal on a magnetic tape by superimposing it to a video signal and which reproduces the audio signal comprising:

means for compressing an original dynamic range of said audio signal in a predetermined frequency band to thereby output an audio signal having a compressed dynamic range;

means for angle-modulating a carrier signal with an output signal of said means for compressing to produce an angle-modulated audio signal, said carrier signal having a lower frequency than a frequency band of a modulated video signal to be recorded;

means for recording said angle-modulated audio signal on said magnetic tape by superimposing it to said modulated video signal;

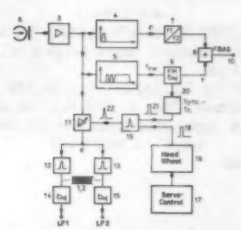
reproducing means for picking up and demodulating said angle-modulated audio signal recorded on said magnetic tape; and

means for expanding a dynamic range of the audio signal demodulated by said reproducing means so as to make said audio signal have the original dynamic range.

4,490,754
VIDEO RECORDER WITH REDUCED AUDIO INTERFERENCE

Hans-Jürgen Kluth, Garbsen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,474
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, 3116130; Jun. 5, 1981, 3122415
Int. Cl.³ H04N 5/782
U.S. Cl. 360—19.1 15 Claims



1. In a system for playing back a television signal, composed of a picture carrier which is FM modulated with a video signal and an audio carrier which is FM modulated with an LF audio signal, recorded along oblique tracks on a magnetic tape, the system including two playback heads which alternately scan successive tracks, the improvement comprising: a controllable amplifier connected to conduct the modulated audio carrier signal provided by said heads; and means connected for applying a keying pulse to said amplifier at the time that scanning switches from one head to the other, for increasing the gain of said amplifier, as a function of said keying pulse, to an extent to cause said amplifier to generate output oscillations at a selected frequency at least approximately equal to the audio carrier frequency for reducing audio interference occurring as a result of amplitude breaks in the recorded audio carrier.

4,490,755

RECORDING AND REPRODUCING VIDEO SIGNALS AT SELECTABLE DIFFERENT TAPE TRAVELING SPEEDS FROM PLURAL VIDEO HEAD PAIRS

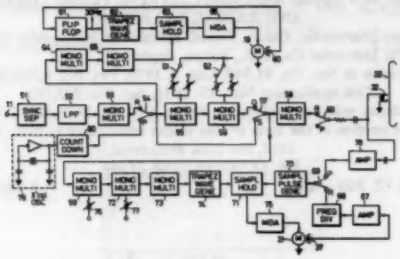
Yoshio Tokuyama, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed Jul. 6, 1982, Ser. No. 395,219

Claims priority, application Japan, Jul. 9, 1981, 56-107372; Jul. 10, 1981, 56-102475[U]

Int. Cl.³ G11B 5/008, 15/46

U.S. Cl. 360—70 7 Claims



1. A video signal recording and reproducing apparatus for recording and reproducing a video signal on and from a magnetic tape, by selecting an arbitrary recording and reproducing time mode from among a plurality of recording time modes and a plurality of reproducing time modes in which tape traveling speed and track pitch differ and recording and reproducing time for the same length of magnetic tape differ, and selecting a plurality of pairs of video heads, said video signal recording and reproducing apparatus comprising:

recording and reproducing means for recording a frequency-modulated video signal on tracks formed obliquely with respect to the longitudinal direction of the magnetic tape and reproducing the recorded frequency-modulated video signal from said tracks by a selected pair of said video heads;

a capstan for driving said magnetic tape in travel at a desired tape traveling speed among a plurality of tape traveling speeds, said desired tape traveling speed being in accordance with the selected recording and reproducing time mode;

a head servo circuit supplied with a vertical synchronizing signal within the video signal or a signal in phase synchronism with the vertical synchronizing signal as a reference signal upon recording, and supplied with a reference signal from a reference signal generating circuit upon reproduction, for rotating said plurality of pairs of video heads at a constant speed;

a first delay circuit for delaying a signal used as the reference signal for said head servo circuit;

a control head for recording an output signal of said first delay circuit as a control pulse onto a control track on said magnetic tape;

a second delay circuit for delaying an input signal or an output signal of said first delay circuit; and

a capstan speed control circuit for controlling said capstan to rotate at a rotational speed so that said magnetic tape travels at said desired tape traveling speed which is in accordance with the selected recording time mode upon recording, and supplied with a reproduced control pulse from said control head and the output signal of said second delay circuit upon reproduction, for controlling said capstan to rotate at a rotational speed so that said magnetic tape travels at said desired tape traveling speed which is in accordance with the selected reproducing time mode upon reproduction responsive to a compared output which is obtained by comparing phases of the signals supplied to said capstan speed control circuit upon reproduction.

4,490,756

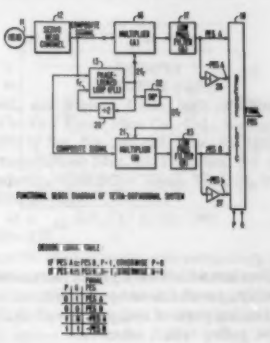
SERVO ENCODEMENT AND DETECTION SYSTEM USING TETRA-ORTHOGONAL SERVO PATTERN

Martin H. Dost, Los Gatos; Chung C. Liu, and Francis E. Mueller, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 1, 1982, Ser. No. 438,219

Int. Cl.³ G11B 5/58

U.S. Cl. 360—77 7 Claims



1. A servo track encodement system for positioning a magnetic head over a selected one of a plurality of data tracks on a magnetic medium, comprising

a servo pattern recorded on said medium along with said data tracks,

said servo pattern comprising a plurality of servo tracks,

each said servo track having a reference signal recorded therein, said reference signal having the same frequency and phase in each of said servo tracks,

each said servo track also having a control signal recorded therein, said control signals having a higher frequency than said reference signals, the phases of said control signals in adjacent ones of said servo tracks cyclically revolving in 90° increments through 90°, 180°, 270°, and repeating themselves every four tracks, the boundary between adjacent servo tracks defining the centerline of one of said data tracks, and

means for detecting the amount of each type of said control signal in the total signal reproduced by said head to produce an indication of the position of said head relative to one of said data track centerlines.

4,490,757

TAPE RECORDER

Toshio Mogi, Ayaseshi, Japan, assignor to Kabushiki Kaisha Welwod, Ayaseshi and Kabushiki Kaisha Takeuchi Sangyo, Kawasakishi, both of, Japan

Filed Sep. 9, 1982, Ser. No. 416,254

Int. Cl.³ G11B 15/18, 15/24

U.S. Cl. 360—94 5 Claims

1. A tape recorder comprising

(a) an outer casing in which a pair of reel shafts are projected from a cassette receiving surface where a cassette is adapted to be secured, a recording/reproducing part is provided at one side parallel to a line between said reel shafts, and a pair of slits which are symmetrically provided in reference to the center line between said pair of reel shafts which are respectively protruded through each of said slits to permit shifting of said reel shafts along said

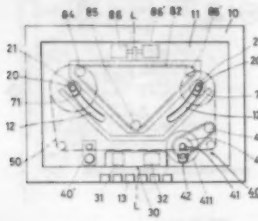
slits and the end parts of said slits which face said recording/reproducing part are located near said center line,

(b) at least one tape feeding means which is provided on said recording/reproducing part and one side of said outer casing,

(c) a shifting means which shifts said pair of reel shafts along said slits so that said reel shafts are arranged at symmetrical positions in reference to said center line,

(d) a bearing part which is provided at each of the roots of said pair of reel shafts,

(e) a driving means which drives selectively the bearing parts of said pair of reel shafts to rotate said reel shafts in a tape rewinding direction and comprises



(i) an endless belt which has a pair of extensions which are substantially parallel to said pair of slits and are opposed to the bearing parts of said pair of reel shafts,

(ii) a drive pulley which selectively moves said endless belt in either of forward and reverse directions, and

(iii) a movable base which is mounted with said endless belt and said drive pulley and located neutrally between the bearing parts of said pair of reel shafts to move so as to selectively depress said endless belt onto said bearing parts by a deviating means, and

(f) a braking mechanism which stops said pair of reel shafts when said movable base is at a neutral position,

wherein the distance between said reel shafts is adjustable to the distance between the reels of cassettes of different sizes by shifting said reel shafts.

4,490,758

PINCH-HOLDER FOR MAGNETIC DISK

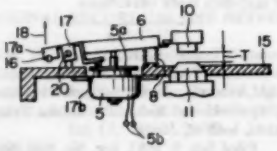
Akio Hoshi, Chichibu, Japan, assignor to Canon Denshi Kabushiki Kaisha, Saitama, Japan

Filed Feb. 11, 1982, Ser. No. 348,150

Claims priority, application Japan, Mar. 19, 1981, 56-40147

Int. Cl.³ G11B *5/54*

U.S. Cl. 360—105 **8 Claims**



1. A pinch-holder for a magnetic disc, comprising:

means having a first pinch member and a second pinch member for pinching and supporting a magentic disc therebetween, said first pinch member and second pinch member being mounted for relative movement toward and away from each other between a first position spaced relatively far apart, a second position spaced less far apart than in said first position, and a third position for pinching and supporting a magnetic disc therebetween;

moving means for moving said first pinch member and said second pinch member between said first and second positions; and

driving means for moving said first pinch member from said second position to said third position to pinch and support a magnetic disc between said first pinch member and said second pinch member, whereby relative impact between said first and second pinch members and the magnetic disc, upon movement of said first and second pinch members to said third position, is mitigated.

4,490,759

ROTARY HEAD ASSEMBLY HAVING FLUID THRUST AND RADIAL BEARINGS

Teruo Maruyama, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Tokyo, Japan

Division of Ser. No. 81,340, Oct. 3, 1979, Pat. No. 4,301,487.

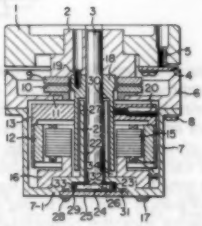
This application Nov. 17, 1981, Ser. No. 322,083

Claims priority, application Japan, Oct. 16, 1978, 53-127535

The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.

Int. Cl.³ G11B *5/52, 21/04*

U.S. Cl. 360—107 **4 Claims**



1. A rotary head assembly, comprising:

(a) a stationary sleeve having one end securely fixed to a base;

(b) a rotary shaft coaxial with and rotatably extended through said stationary sleeve, leaving a cylindrical space therebetween and contained within said base;

(c) a rotary sleeve coaxial with and radially surrounding said stationary sleeve, leaving a cylindrical space therebetween, said cylindrical spaces communicating with each other, said rotary shaft extending through said rotary sleeve and being fixed thereto;

(d) a stationary cylinder securely mounted on said base coaxially of said stationary sleeve;

(e) a rotary cylinder which has the same outer diameter as that of said stationary cylinder and is mounted securely on said rotary shaft adjacent to said stationary cylinder and axially spaced apart from said stationary cylinder by a predetermined distance;

(f) a means for driving said rotary cylinder;

(g) a head securely mounted on said rotary cylinder for sliding contact with a tape which is wrapped and transported around the cylindrical surfaces of said stationary and rotary cylinders; and

(h) a lubricating fluid filled into the space between said stationary sleeve and said rotary shaft, and the space between said stationary sleeve and said rotary sleeve, thereby forming a bearing fluid film portion consisting of

(i) a thrust bearing portion which is defined by a flange which is secured to or formed integral with said rotary shaft and has a diameter greater than that of said rotary shaft and the wall surfaces of said stationary sleeve, said flange having a surface adjacent a supporting portion of said base, said surface having a conical recess therein coaxial with said rotary shaft, a pivot bearing being captured in said conical recess and contiguous with said supporting portion of said base,

(ii) seal means to preclude leakage of said lubricating fluid, and

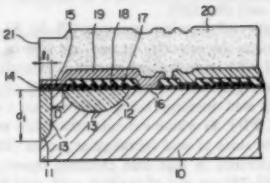
(iii) a radial bearing portion defined by said cylindrical spaces and said fluid, said driving means being mounted exterior of said radial bearing portion.

4,490,760

THIN-FILM MAGNETIC HEAD

Nobuyuki Kaminaka; Kenji Kanai, both of Neyagawa, and Noboru Nomura, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 18, 1982, Ser. No. 340,367
Claims priority, application Japan, Jan. 23, 1981, 56-9287
Int. Cl.³ G11B 5/16, 5/25, 5/20
U.S. Cl. 360—126 7 Claims



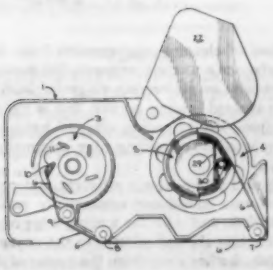
1. A thin-film magnetic head comprising: a magnetic substrate; a lower magnetic layer formed on said magnetic substrate; an upper magnetic layer formed on said lower magnetic layer with at least one conductive layer interposed therebetween, a part of said upper magnetic layer being jointed to said magnetic substrate while another part of said upper magnetic layer is jointed to said lower magnetic layer through a non-magnetic layer constituting a magnetic gap, so that a closed magnetic circuit is formed by said lower magnetic layer, said magnetic substrate, said upper magnetic layer and said non-magnetic layer; and a non-magnetic material filling in a groove which is defined between said lower magnetic layer and said magnetic substrate and which is formed in the side surface of said magnetic substrate which is adapted to face a magnetic recording medium.

4,490,761

CASETTE RECORDER CLEANING UNIT

Victor W. Wolynski, Orlando; James G. Horian, and Robert L. Horian, both of Longwood, all of Fla., assignors to Calibron Corporation, Lake Mary, Fla.

Filed Aug. 2, 1982, Ser. No. 404,392
Int. Cl.³ G11B 5/41
U.S. Cl. 360—128 4 Claims



1. A replaceable bobbin for a cassette cleaner unit used for the purpose of cleaning a record and/or playback device, the combination comprising:

a filament spool having a central hub with a pair of spaced retainer flanges which extend radially outward from the respective ends of the hub, and having coupling means on each end of the hub for engaging a bobbin spool in the cassette cleaner unit,

a cleaning filament having one end attached to the filament spool and being wound around the hub and disposed between the flanges,

said cleaning filament being moistened with a liquid cleaning agent to improve the cleaning action of the filament, and said spool and moistened filament being sealed in packaging material which prevents evaporation of the liquid cleaning agent prior to distribution to the end user for installation in the cassette cleaner unit.

4,490,762

CLEANING TAPE

Goro Akashi, and Wataru Ueno, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 246,769, Mar. 23, 1981, abandoned.
This application Mar. 10, 1983, Ser. No. 472,386
Claims priority, application Japan, Mar. 21, 1980, 55-35959; Apr. 16, 1980, 55-50200
Int. Cl.³ G11B 5/41
U.S. Cl. 360—128 5 Claims

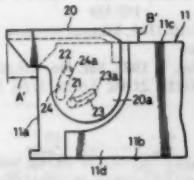
1. A magnetic head cleaning tape comprising a polyethelene terephthelate support having coated thereon a cleaning layer consisting essentially of a binder and uniformly dispersed therein resin particles having an averge particle size of 5–200μ.

4,490,763

TAPE CASSETTE

Mitsuo Hoshino, Kasukabe, and Takashi Yamamoto, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 355,238
Claims priority, application Japan, Mar. 9, 1981, 56-32498
Int. Cl.³ G11B 23/02, 5/008, 15/66
U.S. Cl. 360—132 4 Claims



1. A tape cassette comprising:

a reel having a tape wound thereon,

a housing for containing said reel therein, said housing having an opening permitting the passage of said tape therethrough;

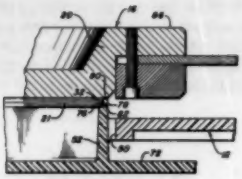
a lid pivoted on said housing for movement between a closed position covering said opening and an opened position exposing said opening, a pivotal connection between said lid and said housing comprising a pair of spaced pins and a pair of arcuate grooves receiving said pair of pins,

the center-to-center spacing between said pins being substantially equal to the radii of curvature of said arcuate grooves, said grooves being positioned and arranged such that as one pin reaches its limit of travel in its associated groove, the second pin beings its travel in its associated groove and upon reaching its limit of travel positions said lid in its opened position.

4,490,764
DISC PACK ASSEMBLY

David E. Butz, Littleton, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.

Filed May 10, 1982, Ser. No. 376,685
Int. Cl.³ G11B 23/02
U.S. Cl. 360—133 8 Claims

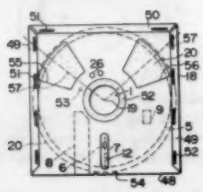


1. A disc pack comprising:
a top cover and a bottom cover permanently secured together,
a hub assembly,
a magnetic memory disc attached to the hub assembly,
a detachable cover for closing said opening,
means on the top cover coacting with said hub assembly to limit axial and radial movements of the disc between the covers when the detachable cover is removed from the pack,
a circular opening in the center of the bottom cover exposing the bottom of the hub assembly,
an annular shoulder formed in the bottom of the hub assembly and having a smaller diameter than the opening in the bottom cover so that it is exposed through said opening,
and a cylindrical wall permanently fixed to the detachable cover and of a height sufficient to extend through the opening in the bottom cover and to engage the bottom and sides of the annular shoulder so as to hold the disc in place and clamped against the top cover to prevent axial and lateral movement of the disc relative to the top and bottom covers.

4,490,765
DISKETTE FOR CLEANING A FLOPPY-DISC DRIVE HEAD

Yoshiro Nakamats, 1-10-1105, Minami Aoyama 5-chome, Minato-ku, Tokyo, Japan

Filed Sep. 1, 1983, Ser. No. 528,608
Int. Cl.³ G11B 23/02, 5/016, 5/10, 5/12
U.S. Cl. 360—133 1 Claim

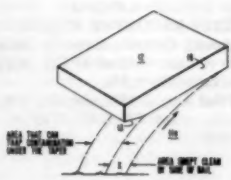


1. A cleaning diskette comprising a rectangular jacket (18) with a central window (52) and an annular cleaning disc (20) therewithin and having a center hole (1) aligned with and smaller than said window (52), said diskette being suitable for use in a floppy disc drive apparatus having:
(1) a floppy disc drive head (6),
(2) an elongated platen (8) adapted to extend from an edge of an inserted diskette to adjacent the jacket central window (52) and generally tangential to the disc center hole (1),
(3) and a foam pad (9) spaced arcuately from the side of said drive head (6) remote from said platen (8) and generally transversely across from the inner terminus of said platen (8),
(4) said platen (8) and foam pad (9) being positioned to be disposed on the side of an inserted diskette jacket (18) opposite from said head (6) to urge the jacket toward the drive head (6); said cleaning diskette further comprising, in combination:
(a) folded flaps (11) on at least some of the sides of said jacket (18) to form a flat envelope,
(b) an elongated radial slot (12) extending through said jacket (18) and exposing said cleaning disc (20) for engagement on one side of said jacket by the said drive head (6), said slot extending from the outermost to the innermost track of said disc,
(c) at least one circular opening (26) extending through said jacket (18) and disposed adjacent the edge of said central window (52) for registering with an index hole (53) on said disc (20),
(d) a plurality of cleaning openings (55–56, 58–60, 62–73) disposed on the opposite of said one side of said jacket (18) and with said cleaning openings extending radially a distance generally equal to the length of said radial slot (12); said openings being disposed on a disc radius line (57, FIG. 8) which extends other than perpendicular to the sides of said rectangular jacket (18),
(e) characterized in that said cleaning openings (55–56, 58–60, 62–73) are out of registry with said folded flaps (11), said central window (52), said radial slot (12) and said circular opening (26) of said jacket (18); and furthermore are positioned to be out of registry with said elongated tangential platen (8) and said arcuately spaced foam pad (9) when the platen and pad urge said jacket toward said drive head (6).

4,490,766
MAGNETIC RECORDING DISK CLEANING USING CONTROLLED ACTUATOR MOTION

Murray K. Hill, San Jose, and William H. McConnell, Los Altos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,125
Int. Cl.³ G11B 21/04
U.S. Cl. 360—137 3 Claims



1. A method of cleaning contaminants from the magnetic recording surface of a rotating magnetic disk having recording tracks therein with an air bearing magnetic slider of the type comprising a tapered leading portion that is joined to a nontapered longitudinally extending side rail having a magnetic transducer mounted on its trailing edge, said method comprising the steps of:
positioning said slider closely adjacent said recording surface with said transducer substantially radially aligned with said disk, and with the leading edge of said leading portion slightly skewed relative to the center of the disk and slightly farther away from the center of the disk than said trailing edge,
moving said slider in a radial direction while maintaining said transducer radially aligned with said surface, such radial movement being incremental and halted after each increment of movement for a period of time at least equal

to the time of one revolution of said disk surface, said increments not exceeding a distance X, and the point at which said tapered leading portion joins said side rail being offset outwardly from the center of said disk said distance X relative to said trailing edge,

the rate of such incremental movement being slow enough in relation to the rotational velocity of said disk as to insure that the longitudinally extending side of said side rail encounters and dislodges said contaminants from said surface before said contaminants can encounter and become wedged under said tapered leading portion.

4,490,767

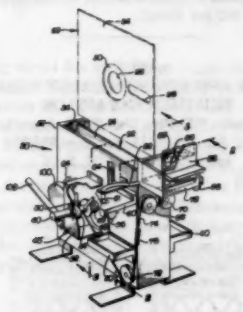
MANUALLY OPERATED CONDITIONER FOR FLEXIBLE MAGNETIC DISKS

Eli Neuman, Tarzana, and C. Paul Davis, Woodland Hills, both of Calif., assignors to Perfectdata Corporation, Chatsworth, Calif.

Continuation-in-part of Ser. No. 257,769, Apr. 27, 1981, abandoned. This application Apr. 8, 1982, Ser. No. 366,544

Int. Cl.³ G11B 5/00

U.S. Cl. 360—137 **10 Claims**



1. A device for treating with fluid a floppy disk or the like disposed in an envelope and having a magnetic information storing surface comprising:

means for releasably grasping said disk and rotating it about its center while said envelope remains stationary;

a pad movable into contact with the magnetic information storing surface of the disk through a read-write opening in the envelope;

fluid dispensing means for providing to said pad fluid for treating a floppy disk; and

means for moving said pad into and out of contact with the information storing surface of the disk, said means mechanically coupled to said means for releasably grasping said disk and rotating it about its center.

4,490,768

APPARATUS FOR PREVENTING ARC DISCHARGE OF TRANSFER SWITCH CIRCUIT FOR INDUCTIVE LOAD

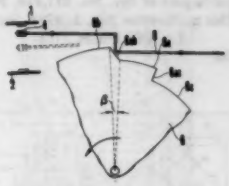
Toshihiro Mori; Yoshifumi Imai, both of Sagamihara; Masanori Matsui, Kawaski, and Masao Masumura, Hachiouji, all of Japan, assignors to Jeco Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 21,132, Mar. 16, 1979, abandoned. This application Jan. 21, 1983, Ser. No. 460,092

Int. Cl.³ H01H 3/42

U.S. Cl. 361—2 **1 Claim**

1. In an arc discharge preventing apparatus for a transfer switch circuit comprising transfer switch means including first and second stationary contacts connected across a source of supply, a movable contact means coupled to an inductive load, and means for transferring said movable contact means between first and second contact positions in which said movable contact engages said first and second stationary contacts, respectively, the improvement wherein said transferring means includes camming means engaged with said movable contact means for controlling the position thereof, and means for rotating said camming means, said rotating means having a backlash angle, said camming means including a first camming surface for maintaining said movable contact means in said first contact position, a second camming surface for maintaining



said movable contact means in said second contact position, a third camming surface for maintaining said movable contact in an intermediate position between said first and second contact positions, and a fourth camming surface providing a transitional slope between the trailing edge of said first camming surface and the leading edge of said third camming surface, said fourth camming surface subtending an angle substantially equal to said backlash angle.

4,490,769

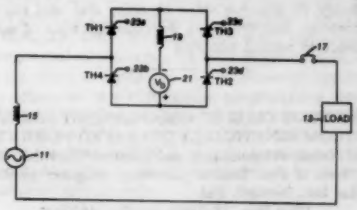
SOLID-STATE CIRCUIT BREAKER WITH CURRENT LIMITING CHARACTERISTIC USING A SUPERCONDUCTING COIL

Heinrich J. Boenig, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 16, 1982, Ser. No. 408,108

Int. Cl.³ H02H 7/00, 9/00

U.S. Cl. 361—58 **4 Claims**



1. A solid-state circuit breaker and current control system for a load supplied current from an ac source having a source impedance, said solid-state circuit breaker and current control system comprising:

a thyristor bridge interposing said ac source and said load, said thyristor bridge having four legs and four nodes with a first node thereof connected to said ac source and a second node connected to said load;

a superconducting coil having an impedance larger with respect to said source impedance;

a dc source connected in series with said superconducting coil between a third and a fourth node of said thyristor bridge, said dc source of such voltage and current levels as to forward bias each leg of said thyristor bridge sufficiently as to permit bidirectional current flow therethrough at a desired maximum current level generated by said ac source; and

control means for limiting under fault conditions said ac current flow to said load to twice the desired maximum current level generated by said ac source, and

for gating said thyristor bridge under fault current condi-

tions to quickly reduce ac current therethrough to zero and thereafter to keep said thyristor bridge open thereby preventing further current flow therethrough.

4,490,770

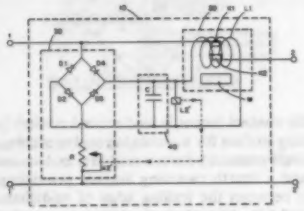
OVERLOAD PROTECTION OF LOUDSPEAKERS

Horace R. Phillimore, 126 Oaks Rd., Millington, N.J. 07946

Continuation-in-part of Ser. No. 011,914, Feb. 2, 1979, abandoned. This application Jun. 2, 1981, Ser. No. 269,571

Int. Cl.³ H02H 3/08

U.S. Cl. 361—94 10 Claims



1. An overload protection unit comprising

a reed switch for interconnecting a driver with a load; and

a sensor for monitoring the output of said driver, which comprises

(a) a rectifier,

(b) a resistor connected in series with said rectifier and having resistive values which change when said reed switch operates,

(c) means for connecting said rectifier to operate said reed switch when an overload condition is sensed, and

(d) means associated with said reed switch for changing the resistive value of said resistor whereby an overload condition sensed by said rectifier causes said reed switch to operate and said protective resistor to simultaneously change its resistive value in order that said rectifier is protected simultaneously with the operation of said reed switch to protect said load.

4,490,771

CONTROL CIRCUIT ARRANGEMENT FOR AN ELECTROMAGNETICALLY OPERATED POWER TOOL

Siefried Huber, Johannesberg, and Manfred Merkator, Wiesbaden, both of Fed. Rep. of Germany, assignors to Black & Decker Inc., Newark, Del.

Filed Nov. 23, 1982, Ser. No. 443,966

Claims priority, application United Kingdom, Dec. 9, 1981, 8137134

Int. Cl.³ H01H 47/32

U.S. Cl. 361—154 4 Claims

1. A control circuit arrangement for an electromagnetically operated power tool, comprising:

a primary circuit for connection to an AC voltage supply and including a solenoid and a thyristor in series;

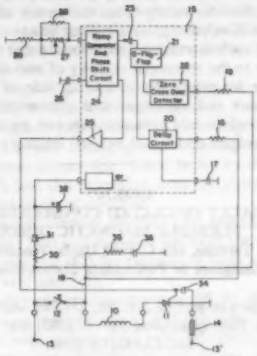
said thyristor being capable of being triggered into a conducting state upon application of a trigger signal from a trigger control circuit for an adjustable part of a half-cycle of the AC supply voltage;

said trigger control circuit being actuated upon closure of a main trigger switch connected thereto;

said main trigger switch being connected in series with said solenoid and said thyristor in said primary circuit for supplying current to the solenoid;

a delay circuit in said trigger control circuit for delaying the generation of a trigger signal for a predetermined period after closure of the main switch so as to delay firing of the thyristor to prevent arcing at the contacts of the main trigger switch; and

said trigger control circuit including a ramp generator and phase shift circuit for generating a trigger signal for enabling energisation of the solenoid in response to actuation of the main trigger switch.



4,490,772

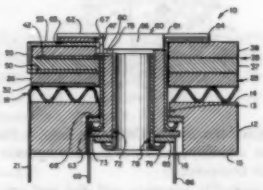
VOLTAGE AND MECHANICALLY VARIABLE TRIMMER CAPACITOR

Martin J. Blickstein, 927 Pine Oak Trail, Austell, Ga. 30001

Filed Jun. 13, 1983, Ser. No. 503,875

Int. Cl.³ H01G 7/00, 5/06

U.S. Cl. 361—281 12 Claims



9. In a mechanically tunable capacitor including a first electrode, a second electrode and a dielectric therebetween, a piezo electric means associated with said first electrode for changing the dimensions of the interface between said first electrode and said dielectric in response to an electrical stimulus.

4,490,773

CAPACITIVE PRESSURE TRANSDUCER

E. Marston Moffatt, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1983, Ser. No. 562,627

Int. Cl.³ H01G 7/00; G01L 9/12

U.S. Cl. 361—283 9 Claims

6. A capacitive pressure transducer comprising:

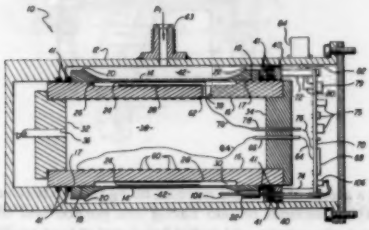
outer cylinder means, having open ends and having a flexible membranous cylindrical wall, said wall having an electrically conductive layer on its inner surface to form a first capacitor pla. ;

inner cylinder means, concentrically mounted within said outer cylinder means, having rigid walls with an electrically conductive layer on the outer surface to form a second capacitor plate, said inner cylinder mating with said outer cylinder such that a sealed first annular chamber is formed between said first capacitor plate and said second capacitor plate, said inner chamber being sealed at its ends to form an inner chamber therewithin for contain-

ing a gas under an inner chamber pressure, said annular chamber communicating with said inner chamber through a perforation in the wall of said inner cylinder such that said first annular chamber and said inner chamber are at the same pressure;

inductor means, integral to the inner wall of said inner cylinder means and having the form of a cylindrical helix; and

housing cylinder means, having said inner and outer cylinders mounted concentrically therein thereby forming a second annular chamber between the outer walls of said outer cylinder and the inner walls of said housing cylinder



and having means for introducing a gas under a variable pressure higher than said inner chamber pressure into said second annular chamber thereby exposing said outer wall of said outer cylinder to a variable outer pressure higher than said inner chamber pressure, said outer pressure causing said membrane to deflect towards said rigid wall such that the distance between said first capacitor plate and said second capacitor plate is decreased according to the difference between said inner chamber pressure and said variable outer pressure thereby varying the capacitance between said plates in proportion to said difference.

4,490,774

CAPACITORS CONTAINING POLYFUNCTIONAL ACRYLATE POLYMERS AS DIELECTRICS

Daniel R. Olson, and Timothy W. O'Donnell, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,871
Int. Cl.³ H01G 4/06; H01B 3/20
U.S. Cl. 361—311 **20 Claims**

1. A capacitor comprising two electrodes separated by a dielectric member, said dielectric member comprising a polymer of at least one polyfunctional acrylate having the formula

$$R^1(OC-C(R^2)=CH_2)_n \quad (I)$$

wherein

R^1 is an aliphatic, alicyclic or mixed aliphatic-alicyclic radical derived from a polyhydroxy compound of the formula $R^1(OH)_n$ and having about 10–40 carbon atoms which optionally contains up to about three olefinic linkages, said olefinic linkages being non-conjugated;

R^2 is hydrogen or methyl; and

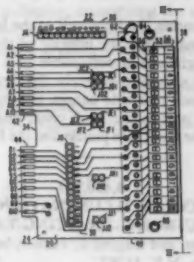
n is from 2 to 4.

4,490,775

UNIVERSAL PROGRAMMABLE INTERFACE

Wing C. Quan, Waldwick, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 24, 1982, Ser. No. 381,257
Int. Cl.³ H05K 1/18
U.S. Cl. 361—406 **4 Claims**



1. A universal, programmable interface assembly, comprising:

electrical apparatus having a plurality of discrete conductors,

a first multiconductor cable terminated by first and second card-edge connectors,

at least one printed circuit board having circuits to be connected to said electrical apparatus, said at least one printed circuit board having a plurality of contact fingers connected to said circuits, with the first card-edge connector of said cable being engaged with said contact fingers,

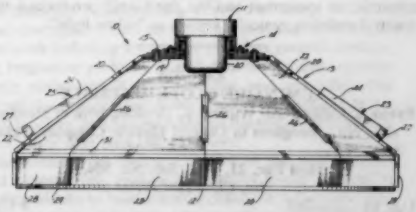
a programmable printed circuit board having first and second major opposed surfaces, contact fingers on both major surfaces, with the second card-edge connector of said cable being engaged with at least certain of said contact fingers, circuit traces on both major surfaces connected to said contact fingers, a barrier terminal strip on the first major surface having conductors and associated terminals, with said conductors being connected to predetermined circuit traces on both major surfaces, and with the discrete conductors of said electrical apparatus being connected to said terminals, programming pins on the first major surface connected to circuit traces on both major surfaces, and means electrically interconnecting predetermined programming pins to connect predetermined contact fingers on both major surfaces to the terminals of said terminal strip.

4,490,776

COLLAPSIBLE RIGID LIGHT BOX

Michael M. Kluch, 2230 E. Crary St., Pasadena, Calif. 91104

Filed May 9, 1983, Ser. No. 493,012
Int. Cl.³ G03B 15/02
U.S. Cl. 362—16 **25 Claims**



1. A rigid collapsible light box comprising:

a rigid back panel having a select number of side edges and an opening in which a light unit having a lamp can be mounted;

a rigid rear side panel hingedly connected to each side edge of the back panel;

a rigid front side panel hingedly connected to each rear side panel;

a light diffuser panel hingedly coupled to the front side panels;

means for mounting the light unit to the back panel with the lamp disposed within the interior of the light box; and

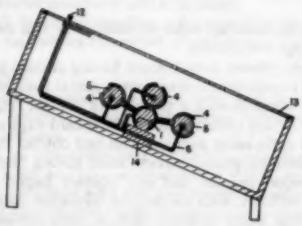
wherein the light box is collapsible to a generally stacked, two-layered structure wherein the first layer comprises the back panel, rear side panels, and means for mounting the lighting unit to the back panel and the second layer comprises the front side panels and the light diffuser panel.

4,490,777

SELECTIVE COLOR ILLUMINATION DEVICE FOR ELECTRONIC DRAFTING TABLES

Stephen E. Tanner, and Eugene J. Tanner, both of 17 Oak Tree Dr., Smithtown, N.Y. 11787

Filed Jun. 25, 1981, Ser. No. 277,179
Int. Cl.³ F21S *3/00*
U.S. Cl. 362—221 **1 Claim**



1. A multiple light device comprised of, a main support tubular member or rod having contact pins at each end with electrical wires connected to said pins and emerging from the center of said member which is of a length similar to standard fluorescent lamps, support members both laterally and radially adjustable affixed to both the main support member and lamp sockets/fixtures by friction fit or adhesive, a switching device connected to the main support contact pins and the lamp sockets via electrical wires comprised of a plastic enclosure with a self adhesive outer/upper surface, enclosing multiple sets of equally spaced magnetic field sensing devices (reed switches or hall effect devices) with only one device or set of devices actuated at any given time completing the electrical circuit from the main support member contact pins to one of the lamp sockets by manual random hand placement of a magnet over one or one set of said field sensors, and multiple light emitting devices principally of fluorescent lamp type supported by and electrically connected to the lamp sockets wherein two of the lamps each produce a different light emission spectrum or are enclosed in a material having predominantly different optical transmission spectrums and the third lamp produces a broad spectral emission typically known as "white light".

4,490,778

LUMINAIRE GLOBE ASSEMBLY

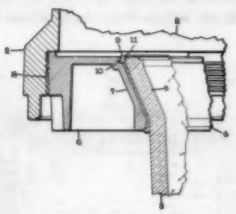
Byron R. Collins, and William K. Dryman, both of Hendersonville, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 21, 1983, Ser. No. 564,118
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—267 **9 Claims**

1. An assembly of a glass globe with a globe ring for a hazardous location luminaire comprising:

a glass globe having a globe portion and a flaring rim portion, said rim portion being substantially circular in cross-section,

a globe ring for supporting said globe and fastening it to a luminaire housing, said globe ring comprising a disc-like metal body adapted for attachment to a luminaire housing, said body having a central conical aperture of predetermined slant length for accommodating said flaring rim portion,



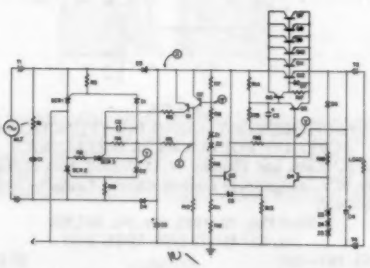
and a gasket of moldable material filling the gap between the faying surfaces of said flaring rim portion and of said conical aperture, said gasket being cast at least against the flaring rim surface of said globe whereby to achieve a nonflame-propagating seal between said globe and said globe ring, said material being one able to withstand temperature cycling and hydrocarbon fumes at the operating temperature of the globe over extended periods of time.

4,490,779

ELECTRIC POWER SYSTEM

Floyd M. Minks, 2155 Dick Island Rd., Kissimmee, Fla. 32741

Filed Mar. 15, 1982, Ser. No. 357,892
Int. Cl.³ H02M *1/14*
U.S. Cl. 363—48 **20 Claims**



1. An electrical system, said system comprising:

a source of alternating current power, the frequency, voltage and waveform of which fluctuate with respect to time and having an impedance to limit the maximum current available therefrom;

first circuit means coupled to said source and containing at least one device normally nonconductive in a given direction, and which may be rendered conducting in said direction responsive to a control signal applied thereto;

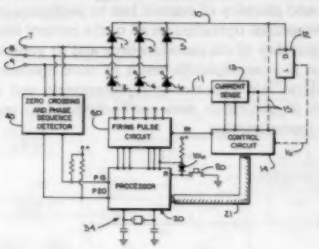
means for supplying said control signal to said device until the voltage output of said first circuit means reaches a desired level, and removing said control signal when said first circuit means output rises above said level; and

an active, low pass filter with a feedback loop set to a desired direct current voltage, and with an input terminal coupled to the output of said first circuit means, the output of said active, low pass filter adapted to supply direct current to said load.

4,490,780
DIGITAL POWER CONVERTER

Thomas A. Nondahl, West Allis, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Feb. 2, 1983, Ser. No. 463,072
Int. Cl.³ H02M 7/155
U.S. Cl. 363—87 5 Claims



1. A control circuit for a static converter, the combination comprising:

a firing pulse circuit for firing thyristors in response to a received firing code;

a zero crossing detector for generating a signal which is synchronized with the line voltage applied to the thyristors;

a free running counter which generates a binary count that is continuoualy changed;

synchronizing means coupled to the zero crossing detector and the free running counter for periodically generating a reference count which indicates the binary count generated by the free running counter at a preselected phase of the line voltage;

input means coupled to receive the reference count from the synchronizing means and summing it with a firing angle command to produce a firing count; and

comparator means coupled to the input means and the free running counter for generating a firing code to the firing pulse ciruit when the binary count generated by the free running counter reaches a value which corresponds to the firing count.

4,490,781
SYSTEM AND METHOD FOR PREPARING NUMERICAL CONTROL INFORMATION

Hajimu Kishi, Hino; Masaki Seki, Takaidonishi; Kunio Tanaka, and Takashi Takegahara, both of Hachioji, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jul. 1, 1981, Ser. No. 279,600
Claims priority, application Japan, Jul. 10, 1980, 55-94173
Int. Cl.³ G06F 3/04, 15/46; G05B 19/18
U.S. Cl. 364—191 38 Claims

1. A system for preparing numerical control information, comprising:

a graphic display device capable of displaying characters, symbols and graphics;

a data input device, operatively connected to said graphic display device, capable of inputting at least numerical values and graphic symbols, prescribed data is input in the form of numerical values and graphics in dependence upon machine tool machining information and inquiries displayed successively on said graphic display device according to a predetermined sequence, said machining information being displayed in the form of characters, symbols, graphics or a selected combination thereof, the input of said prescribed data being repeated according to a sequence necessary for the preparation of numerical control information, thereby to prepare the numerical control information, said data input device comprising a Rand tablet, operatively connected to said graphic display device, information being input by said Rand tablet; and

a device, operatively connected to said graphic display device and said data input device, for executing the preparation of numerical control information, corresponding to the input from said data input device.

29. A method for preparing numerical control information for machining a part, employing a processor, a memory and an input device including a display, comprising the steps of:

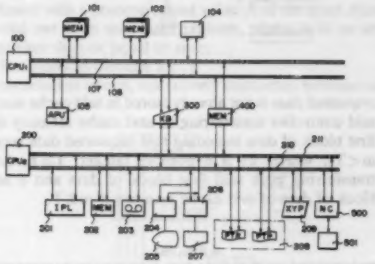
(a) inputting a selected coordinate system;

(b) inputting figure shape graphic symbols representing the shape of the part;

(c) inputting shape and dimensions of starting stock material;

(d) inputting the part dimensions;

(e) inputting designated rough machining areas;



(f) inputting a designated machining starting point;

(g) inputting selected tools for machining;

(h) inputting designated tool information for machining the part;

(i) designating a machining schedule for machining the part;

(j) preparing the machining schedule for machining the part from the selected coordinate system, the figure shape graphic sumbols, the shape and dimensions of the starting stock material, the part dimensions, the designated rough machining areas, the designated machining starting point, the selected tool and tool information, and the designated machining schedule; and

(k) machining in accordance with the prepared machining schedule.

4,490,782
I/O STORAGE CONTROLLER CACHE SYSTEM WITH PREFETCH DETERMINED BY REQUESTED RECORD'S POSITION WITHIN DATA BLOCK

Jerry D. Dixon; Gerald A. Marazas, both of Boca Raton, and Gerald U. Merckel, Delray Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 5, 1981, Ser. No. 270,951
Int. Cl.³ G06F 9/06, 13/00
U.S. Cl. 364—200 22 Claims

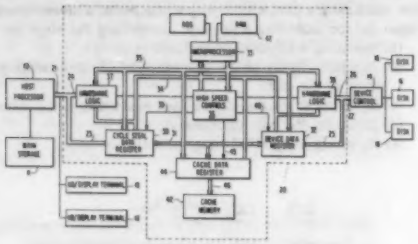
11. A data processing system comprising:

a host processor for requesting a record of data;

at least one memory unit for storing a plurality of blocks of data each including a sequence of n data records occupying respective positions in said data blocks and consecutively designated R_1-R_n including said requested data record R_m, where n and m are positive integers and $m \leq n$, each block of data having a unique file system address and a corresponding hash entry number;

a cache memory for storing a portion of the data stored in said memory unit, said cache memory storing a plurality of data blocks at least a first plurality of which have the same corresponding hash entry number and different file system addresses and a second plurality of data blocks all having hash entry numbers different from one another;

a controller for transferring data between said host processor and cache memory and between said memory unit and cache memory, said controller transferring a first block of data containing the requested data and a second block of data to said cache memory from said memory unit if said



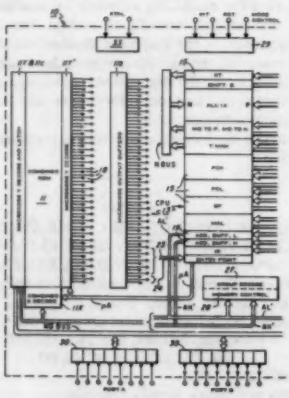
requested data is not already stored in said cache memory, said controller transferring to said cache memory only a first block of data including said requested data record if $m<T_1$, where T_1 is a positive integer, $1 \leqq T_1 < n$ and transferring both said first block of data and a second block of data of said cache memory if $m \geqq T_1$.

4,490,783

MICROCOMPUTER WITH SELF-TEST OF MICROCODE

Kevin C. McDonough, and Jeffrey D. Bellay, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 2, 1981, Ser. No. 280,048
Int. Cl.³ G06F *11/00, 7/00*
U.S. Cl. 364—200 **14 Claims**



1. A microcomputer device formed in a single semiconductor integrated circuit with internal self-test of microcode words, comprising:

a CPU having an ALU with data input/output, a plurality of address/data registers with data input and output, and bus means for accessing said data input and output of the registers and said data input/output of the ALU for data transfer; said ALU, said registers and bus means also having control signal inputs;

control means for defining the operation of the CPU including means for generating a plurality of different microcode words each having a plurality of control bits; said control being coupled to said control signal inputs of said ALU, registers and said bus means for controlling the operation thereof;

storage means in the integrated circuit for storing a check-code representation of all of said bits in all of said plurality of microcode words, and

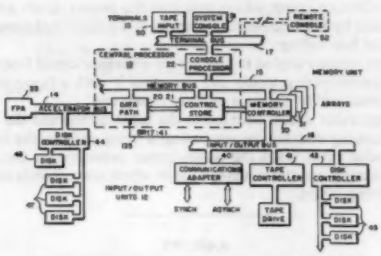
means including said CPU, within said integrated circuit, for accessing said plurality of microcode words in sets of less than said plurality of control bits to perform a cummulative sequential operation on all of the control bits in all of said plurality of microcode words and to generate a first output if a cummulative result of such operation corresponds to said check-code representation and a second output if such result does not correspond to said check-code representation.

4,490,784

HIGH-SPEED DATA TRANSFER UNIT FOR DIGITAL DATA PROCESSING SYSTEM

David C. Ives, 555 Heald Rd., Carlisle, Mass. 01741; David K. Miller, 28 Albion St., Medford, Mass. 02155, and Simon Steely, Jr., 20 Cortez Dr., Nashua, N.H. 03062

Filed Apr. 21, 1982, Ser. No. 370,506
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—200 **28 Claims**



1. A high-speed data transfer unit adapted to connect to a data processing system and an external device, said transfer unit being connected to the data processing system over an interconnection means including first transfer means for transferring port control commands and second transfer means for transferring operational commands and data, said data transfer unit comprising:

A. port control means connected to said first transfer means for receiving port control commands for controlling the receipt of operational commands and the transfer of data over said second transfer means;

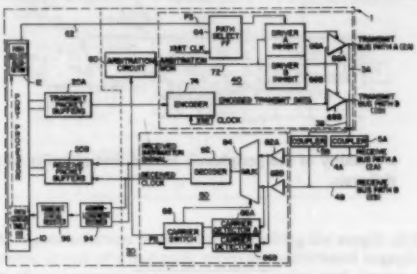
B. operational control means connected to said port control means and said second transfer means for receiving operational commands for controlling the transfer of data with said external device; and

C. buffer means connected to said port control means, said operational control means, the external device and the second transfer means for transferring data between the second transfer means and the external device, said buffer means being responsive to a signal from said external device for transferring data with said external device, and responsive to a signal from said port control means for transferring data with said second transfer means.

4,490,785
DUAL PATH BUS STRUCTURE FOR COMPUTER INTERCONNECTION

William D. Strecker, Harvard; David Thompson, Malden, and Richard Casabona, Stow, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed May 7, 1982, Ser. No. 376,068
Int. Cl.³ G06F 1/00
U.S. Cl. 364—200 8 Claims



1. A high reliability and high availability bus structure for providing communications between the nodes of a computer network, wherein each node includes a host device and at least one port, the port being an interface for connecting the host device to the bus, the bus structure comprising:

A. the bus including at least a first bus path (2A) and a second bus path (2B), said bus paths being independent of each other; and

B. for each port (1)

i. transmitting means (68A, 68B) for transmitting signals onto each of the bus paths,

ii. receiving means (82A, 82B) for receiving signals from each of the bus paths,

iii. path selecting means (e.g., port processor 10) responsive to a signal from the host device which indicates that the host device desires to transmit, for selecting one of said bus paths for use for transmission,

iv. means (64, 66A, 66B) coupled to the path selecting means for enabling the transmitting means to transmit only on the selected path,

v. carrier detect means (86A, 86B) coupled to the receiving means for detecting the presence or absence of signals on each bus path and the beginning of a transmission, and

vi. means (88, 84) responsive to the carrier detect means for selecting only one of the paths for receive signal processing responsive to the presence of signals thereon at the beginning of a transmission.

4,490,786
VECTOR PROCESSING UNIT

Shoji Nakatani, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 14, 1982, Ser. No. 388,196
Claims priority, application Japan, Jun. 19, 1981, 56-95681
Int. Cl.³ G06F 1/00
U.S. Cl. 364—200 8 Claims

1. A vector processing unit, comprising:

a vector register from which a plurality N of successive vector elements belonging to the same vector can be read out in one machine cycle and into which a plurality N of the successive vector elements belonging to the same vector can be written in one machine cycle, where N is an integer greater than or equal to 1;

a mask register from which a plurality of mask elements having the same element numbers as said N vector elements read out from said vector register are read out synchronously with the reading of the corresponding vector elements;

N read data buses, operatively connected to said vector register, for reading which are provided, respectively, for said N vector elements read out from said vector register;

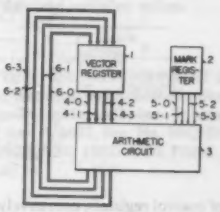
N write data buses, operatively connected to said vector register, for writing which are are provided, respectively, for said N vector elements written into said vector register;

an aligning circuit, operatively connected to said N read data buses and said N write data buses, for connecting each of said N read data buses selectively to each of said N write data buses selectively;

N constant generators for generating N constants corresponding, respectively, to said N read and write data buses when compression transformation and/or extension transformation of the vector elements is executed in accordance with a predetermined value A of the mask elements read out from said mask register, where A is an integer greater than or equal to zero;

N first ports a_0 through a_{N-1};

a first selector circuit, operatively connected between said N



first ports and said N constant generators, for selectively connecting each of said N constant generators to each of said N first ports a_0 through a_{N-1};

a first-selecting-signal generating circuit, operatively connected between said mask register and said first selector circuit, for controlling said first selector circuit in accordance with said N mask elements read out simultaneously from said mask register;

N second ports b_0 through b_{N-1} producing output signals;

a second selector circuit, operatively connected between said N first ports and said N second ports, for selectively connecting each of said N first ports a_0 through a_{N-1} to each of said N second ports b_0 through b_{N-1};

an integrating circuit, operatively connected to said mask register, for integrating the number of mask elements having said predetermined value A among the mask elements read out from said mask register; and

means, operatively connected between said integrating circuit and said second selector circuit, for controlling said second selector circuit in accordance with the integrated number in said integrating circuit, the output signals from said N second ports b_0 through b_{N-1} are used as gate-controlling signals for said aligning circuit.

4,490,787
STO STACK CONTROL SYSTEM

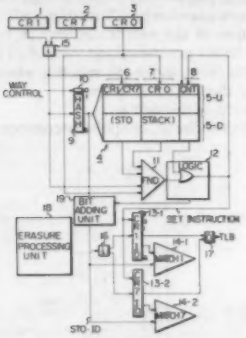
Masayuki Ohya, Kawasaki, Japan, and Masaaki Inou, Stockport, England, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 27, 1982, Ser. No. 423,715
Claims priority, application Japan, Sep. 25, 1981, 56-152514
Int. Cl.³ G06F 9/00
U.S. Cl. 364—200 14 Claims

1. A segment table origin (STO) stack control system connected to a table look-aside buffer (TLB), comprising:

a STO stack divided into portions, that stores STO data based on STO identifies (STO-ID's) generated in dependence on the basis of hashed results of input data designat-

ing virtual spaces, and in which system said STO stack is retrieved when the input data is changed, the STO-ID generated by using said STO stack is transferred to the TLB when the STO data identified by the STO-ID has already been registered in the STO stack, a new STO-ID is formed when the STO data identified by the STO-ID has not yet been registered in the STO stack and the thus formed STO-ID is transferred to the TLB after the STO data is registered in the STO stack and, at the same time, when the old STO-ID's having the same value as the newly formed STO-ID already have the corresponding STO data registered and the number of the old STO-ID's is equal to the number of locations of the STO stack, at least one of the old STO-ID's is erased; and



a plurality of control registers, operatively connected to said STO stack, for storing the input data designating virtual spaces, the STO stack is retrieved depending upon the contents of said plurality of control registers that correspond to a plurality of virtual spaces, and when the content of a given one of the control registers is changed and the STO data having the old STO-ID that is to be erased is the STO data generated in dependence upon the contents of the control register other than the given control register, if the STO data to be erased corresponds to the STO-ID presently used, the STO data corresponding thereto is not erased but, instead the STO data corresponding to the STO-ID not presently used is erased.

4,490,788

WELL-LOGGING DATA PROCESSING SYSTEM HAVING SEGMENTED SERIAL PROCESSOR-TO-PERIPHERAL DATA LINKS

Marvin W. Rasmussen, Austin, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Sep. 29, 1982, Ser. No. 427,070
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—200 **66 Claims**

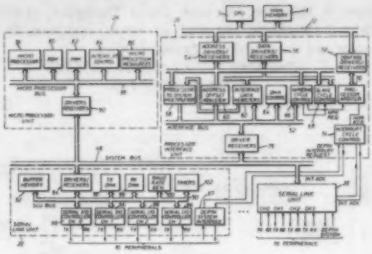
1. A data processing system including peripheral units connected thereto, said system comprising:

(a) a central processor unit including a main memory;

(b) a plurality of serial link units, each having a serial link bus and each having a plurality of serial data input/output channels connected to said serial link bus, each serial channel sending on transmit lines and receiving on receive lines serial data to and from a first plurality of the peripheral units;

(c) a processor interface unit responsive to data ready signals from said processor unit and said serial link units, for controlling the transfer of data between said central processor unit and said plurality of serial link units, said interface unit including an internal interface bus; and

(d) a microprocessor unit responsive to said processor interface unit and said serial link units for initiating the transfer of data between said plurality of serial link units and said processor interface unit, said plurality of serial link units enabling the simultaneous input/output transfer of data to



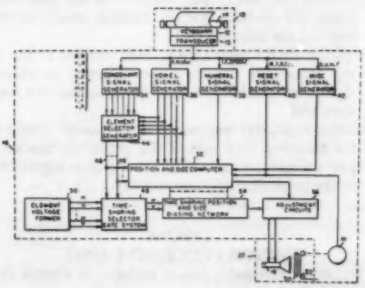
a plurality of the peripherals in said first plurality of peripherals.

4,490,789

METHOD AND MEANS FOR REPRODUCING NON-ALPHABETIC CHARACTERS

Carl Leban, Lawrence, Kans., and Audrey Leban, executor, 608 Saratoga Pl., Lawrence, Kans. 66044

Continuation of Ser. No. 255,867, May 22, 1972, Pat. No. 4,228,507, which is a continuation-in-part of Ser. No. 742,076, Jul. 2, 1968, Pat. No. 3,664,450, which is a continuation-in-part of Ser. No. 682,400, Nov. 13, 1967, abandoned. This application Jul. 11, 1980, Ser. No. 167,426
The portion of the term of this patent subsequent to Oct. 14, 1997, has been disclaimed.
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—419 **30 Claims**



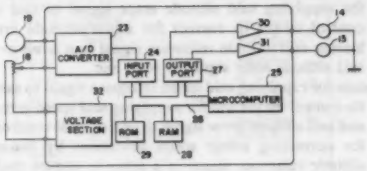
1. The method of transcribing ideographic or other non-alphabetic characters, including the steps of: entering into a computer a string of symbols composed of one plurality of symbols each defining at least one of a finite plurality of elements in the or each character, and a second plurality of symbols each defining one of a finite plurality of juxtapositional relationships of one of the elements to each other for the or each character; in the computer, decoding the string of symbols to determine the identity of each element, and the position of one element relative to the previous element; and transforming the decoded symbols into an assembly sensible as a character or characters.

4,490,790

METHOD AND APPARATUS FOR SELECTING GEARS OF AN AUTOMATIC TRANSMISSION

Kazuo Shinoda, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 20, 1981, Ser. No. 323,553
Claims priority, application Japan, May 29, 1981, 56-80913
Int. Cl.³ B60K 41/08; G06F 15/20
U.S. Cl. 364—424.1 12 Claims



1. A gear selection method for controlling the supply of oil pressure to one of a hydraulic servo and a frictional engaging unit of an automatic transmission by opening and closing an electromagnetic valve to accomplish a predetermined gear selection, said gear selection method comprising the steps of:

detecting the speed of the vehicle;

generating a signal proportional to the speed of depression of an accelerator pedal;

establishing a reference vehicle speed for actuating gear selection;

increasing said reference speed as the signal proportional to the depression speed of the accelerator pedal increases; and

producing output signals for opening and closing said valve in response to said increased reference speed.

6. A gear selection method for controlling a gear selection unit of an electronically controlled transmission for a vehicle, said gear selection method comprising the steps of:

detecting the speed of the vehicle;

generating a signal proportional to the speed of depression of the accelerator pedal of the vehicle;

establishing a reference vehicle speed for actuating gear selection;

increasing said reference speed as the signal proportional to the depression speed of the accelerator pedal increases;

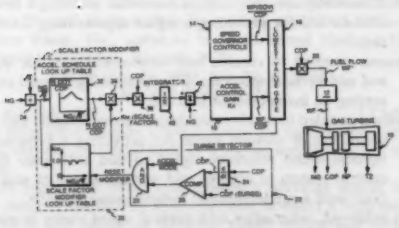
producing output signals for actuating the gear selection unit in response to said vehicle speed and said increased reference speed.

4,490,791

ADAPTIVE GAS TURBINE ACCELERATION CONTROL

Terry Morrison, Vernon, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed Apr. 19, 1982, Ser. No. 369,531
Int. Cl.³ G05B 13/00; F04D 27/02
U.S. Cl. 364—431.02 6 Claims



1. In a method for the exercise of control over the delivery of fuel to a gas turbine engine, the engine including a gas generator having a compressor, the engine further including a fuel metering system which is responsive to fuel flow command signals for varying the rate of delivery of fuel to the engine, an improved mode of varying fuel flow during acceleration of the engine comprising:

storing data comprising an engine acceleration schedule which defines a ratio of a rate of change of gas generator speed to compressor discharge pressure for ratios of gas generator speed to compressor inlet temperature during acceleration, the acceleration schedule comprising a curve defined by a series of points;

storing modifier values which correspond to the stored acceleration schedule data;

detecting engine surges;

varying at least that stored modifier value which corresponds to the point on the acceleration schedule at which a surge has occurred during one acceleration;

combining the acceleration schedule data with the modifier values whereby the schedule data will be varied during accelerations occurring subsequent to the said one acceleration; and

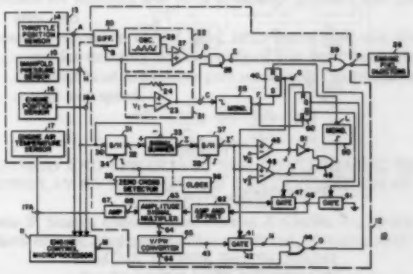
deriving fuel flow commands from the combined acceleration schedule data and modifier values.

4,490,792

ACCELERATION FUEL ENRICHMENT SYSTEM

Robert W. Deutsch, Wheeling, and Robert Martinsons, Chicago, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 9, 1982, Ser. No. 366,958
Int. Cl.³ F02B 3/10; F02D 5/00; F02M 7/06
U.S. Cl. 364—431.07 12 Claims



1. An acceleration fuel enrichment system for an engine, comprising:

sensor means for providing electrical signals representative of a number of sensed engine operational parameters including engine crankshaft rotational position, engine throttle position and engine manifold pressure;

steady state fuel pulse control means coupled to said sensor means for providing base vuel injection pulses synchronized with engine cylinder piston position, the duration of these base fuel injection pulses being determined in accordance with at least one of the sensed engine operational parameters;

wherein the improvement comprises an improved acceleration enrichment means coupled to said sensor means, comprising the combination of;

means for developing at least one initial acceleration enrichment pulse, in addition to said synchronous base fuel injection pulses, in response to an increase in at least any selected one of the sensed engine parameters of engine throttle position and engine manifold pressure causing its rate of change to exceed a predetermined minimum threshold value,

means for terminating the development of said at least one initial enrichment pulse,

means for effectively providing, at least after termination of said at least one initial enrichment pulse, additional fuel enrichment pulses, said additional pulses having durations determined in accordance with a decreasing rate of change of sensed engine manifold pressure which exists after said selected engine parameter has ceased to increase and after a subsequent decrease in engine manifold pressure has been sensed,

means for terminating the providing of said additional fuel enrichment pulses, and

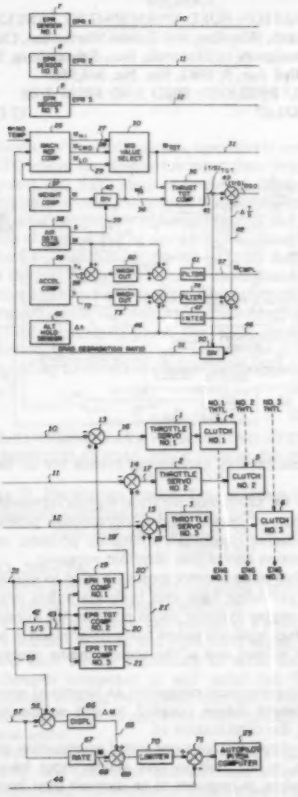
combiner means for effectively adding said at least one initial and additional fuel enrichment pulses to said synchronous base fuel pulses thereby providing a composite engine fuel control signal.

4,490,793

CRUISE SPEED CONTROL FOR AIRCRAFT PERFORMANCE MANAGEMENT SYSTEM

Harry Miller, Scottsdale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,901
Int. Cl.³ G06F *15/14*
U.S. Cl. 364—433 **22 Claims**



1. A speed control system for aircraft having an automatic throttle control means for controlling the thrust imparted to the aircraft and an automatic altitude control means for controlling aircraft pitch attitude to maintain a selected altitude comprising:

means for providing a speed reference signal,

means for providing a signal representing actual speed,

means responsive to said signals for providing a speed error signal proportional to a difference between said speed reference signal and said actual speed signal,

means for providing an altitude reference signal,

means for providing a signal representing actual altitude,

means responsive to said altitude reference and said actual altitude signals for providing an altitude error signal proportional to a difference between said altitude signals and for supplying said altitude error signal to said throttle control means to correct for minor altitude errors by biasing said altitude reference signal in a sense to reduce said altitude error signal to zero, and

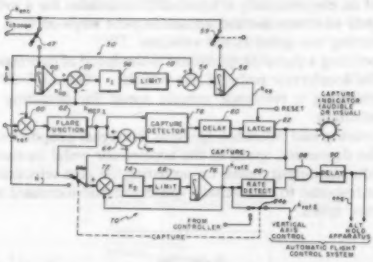
means for supplying said speed reference signal to said throttle control means and for supplying said speed error signal and said altitude error signal to said altitude control means for correcting minor speed deviations by biasing said altitude reference signal in a sense to reduce said speed error toward zero.

4,490,794

ALTITUDE PRESELECT SYSTEM FOR AIRCRAFT WITHOUT AIR DATA COMPUTER

Carl D. Griffith, Phoenix, Ariz.; Paul A. Rauschelbach, Northridge, Calif.; Robert W. Robinson, Phoenix, and Edmund R. Skutecki, Glendale, both of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 18, 1982, Ser. No. 339,951
Int. Cl.³ G05D *1/08*
U.S. Cl. 364—433 **25 Claims**



1. An apparatus for an automatic flight control system of an aircraft having an altimeter capable of providing signals representative of incremental changes in altitude, said apparatus comprising:

means for providing a signal representing vertical speed of said aircraft;

first manually operable control means for selecting a desired altitude and for providing a signal representing that altitude;

means coupled to receive said incremental altitude signal and said vertical speed signal for producing a signal representing an instantaneous altitude;

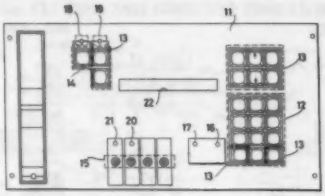
means coupled to receive said desired altitude signal and said instantaneous altitude signal for providing a preselected vertical speed reference signal to said automatic flight control system to control said vertical speed of said aircraft until a predetermined instantaneous altitude

is achieved, whereafter said vertical speed varies in accordance with a prescribed functional relation to altitude differences between said desired altitude and said instantaneous altitude.

4,490,795
APPARATUS FOR CONTROLLING AND PROGRAMMING WELDING GUNS

Piero Calcagno, Collegno, Italy, assignor to Comau S.p.A., Grugliasco, Italy

Filed Feb. 2, 1982, Ser. No. 345,011
Claims priority, application Italy, Feb. 18, 1981, 67225 A/81
Int. Cl.³ B23K *11/24*
U.S. Cl. 364—477 **3 Claims**



1. Apparatus for controlling and programming the energization of the guns of a welding device, comprising

(a) main control means (32), including

(1) keyboard means (11) for programming the successive steps of a welding sequence; and

(2) an alphanumerical display unit (22) for displaying communication messages between said control means and the operator thereof;

(b) programming means for delivering control signals to said main control means, said control signals corresponding to the welding program sequence provided by the operator via said keyboard means, said programming means including

(1) program memory means (30) for storing a welding sequence program; and

(2) microprocessor means (23) for processing signals for execution of the welding program;

(c) input/output means (25) connected with said microprocessor means;

(d) electrical supply means (26) providing power to said microprocessor means;

(e) program storage means (24) connected with said microprocessor means for providing signals indicating the operational state of said control means;

(f) second memory means (31) for storing the welding programs formulated between said main control means and said programming means, said microprocessor means processing signals from said program memory means, said input/output means, and said program storage means to control the firing angle of the static switches of the guns of the welding device as a function of the voltage across the primary of the welding transformer, thereby to maintain the energy constant.

4,490,796
PRINT HEAD MOTOR CONTROL SYSTEM USING ANALOG AND DIGITAL FEEDBACK

Samuel E. Bigbie, Auburn, Ala.; Barry R. Cavill, Boca Raton, Fla.; David F. Dodgen, Boca Raton, Fla., and Albert A. Nawy, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 16, 1981, Ser. No. 312,055
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—519 **7 Claims**

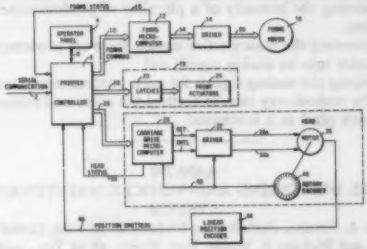
1. Print head velocity control means for maintaining a constant velocity of a print head as it moves across a record medium,

said print head being bidirectionally movable across said record medium and being movable at either a high speed or a low speed on different passes across said record medium, said record medium having a print area and margin areas on either side of said print area, comprising:

motor means having a rotatable shaft, said shaft rotating at a velocity related to the magnitude of a control signal applied to said motor means, said shaft means being coupled to said print head such that said print head moves as said shaft rotates;

emitter means coupled to said shaft for providing pulses representing increments of movement of said shaft;

processor means for providing a reference voltage, said processor means responding to said emitter means pulses to vary said reference voltage as the time between emitter pulses varies;



frequency-to-voltage converter means repsonsive to said emitter means pulses for providing a voltage related to the velocity of rotation of said shaft;

means for generating said control signal in response to the difference between said reference voltage and said voltage from said frequency-to-voltage converter means,

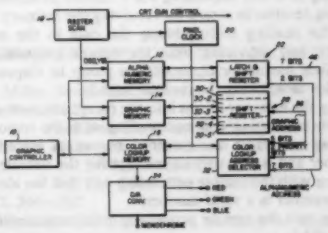
means for stopping said print head after it leaves said print area, and

means responsive to the print head moving at said slow speed for delaying said stopping of said print head when said print head has made a pass across said record medium at said low speed.

4,490,797
METHOD AND APPARATUS FOR CONTROLLING THE DISPLAY OF A COMPUTER GENERATED RASTER GRAPHIC SYSTEM

Kevin P. Staggs, Glendale, and Charles J. Clarke, Jr., Phoenix, both of Ariz., assignors to Honeywell Inc., Phoenix, Ariz.

Filed Jan. 18, 1982, Ser. No. 340,141
Int. Cl.³ G06F *3/153*; G06K *15/20*
U.S. Cl. 364—522 **8 Claims**



1. A method of controlling the display of a raster scan of an orthogonal array of picture elements of a color cathode ray tube in which each picture element has a unique binary address, an addressable display memory in which at each addressable location corresponding to that of a picture element an address in a color lookup memory for an alphanumeric color, for a graphic color and priority signals can be stored, and at which addressed location in a color lookup memory binary

color signals representing the color and intensity of a pixel can be stored, comprising the steps of:

reading from the display memory and producing in synchronism with the raster scan of the CRT the graphic color address, the alphanumeric color address, and the priority signals stored therein for each pixel of the raster-scanned array;

applying to the color lookup memory the color lookup address having priority as determined by the priority signals;

reading from the color lookup memory binary color signals stored at the addressed location, said color signals representing the intensity of a plurality of predetermined colors;

converting the binary color signals for each predetermined color into an analog signal; and

applying the analog signals for each predetermined color to the cathode ray tube to control the color and intensity of each pixel as it is scanned.

4,490,798

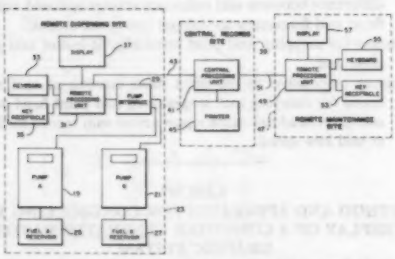
FUEL DISPENSING AND VEHICLE MAINTENANCE SYSTEM

James A. Franks, Fort Worth; Richard R. Martin, Grand Prairie, and Richard F. Walsh, Fort Worth, all of Tex., assignors to Art Systems, Inc., Fort Worth, Tex.

Filed Dec. 16, 1981, Ser. No. 331,250

Int. Cl.³ G01D *4/14*; G06F *11/30*; G07B *15/02*

U.S. Cl. 364—550 **13 Claims**



1. A method of dispensing fuel and indication maintenance for a motor vehicle, comprising in combination:

providing with the vehicle a portable memory means for storing, retrieving and updating selected data of the vehicle;

providing at a fuel dispensing site a remote processing unit having receptacle means for receiving the memory means, and for reading and updating the data in the memory means, and providing with the remote processing unit interface means for controlling a pump to dispense fuel and for monitoring the fuel dispensed;

inserting the memory means into the receptacle means of the remote processing unit and reading with the remote processing unit from the memory means an identification number and a next service mileage for the vehicle;

verifying with the remote processing unit that the identification number is a valid number;

entering into the remote processing unit currentmileage of the vehicle;

comparing with the remote processing unit the current mileage with the next service mileage and notifying the vehicle operator of service needs if the current mileage exceeds the next service mileage;

if the identification number is valid, turning on the pump and monitoring with the remote processing unit the amount of fuel dispensed; and

performing indicated service on the vehicle and updating the next service mileage in the memory means.

4,490,799

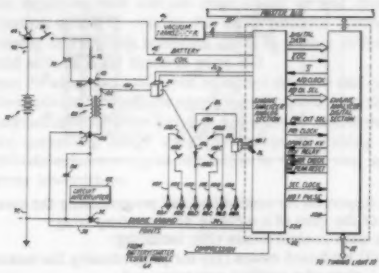
IGNITION COIL TEST APPARATUS

Joseph A. Marino, Waukesha; Michael J. Kling, Mequon, both of Wis.; Sydney J. Roth, Largo, Fla., and Surender K. Makhija, Milwaukee, Wis., assignors to Bear Automotive Service Equipment Company, Milwaukee, Wis.

Filed Dec. 4, 1981, Ser. No. 327,733

Int. Cl.³ G01M *15/00*; G06F *15/20*; G01R *29/02*

U.S. Cl. 364—551 **24 Claims**



1. An ignition coil test apparatus for a multicylinder internal combustion engine having an ignition circuit including an igniter for each cylinder, an ignition coil having a primary winding and a secondary winding, circuit interrupter means connected to the primary winding for periodically switching between a conductive and a nonconductive state to cause the ignition coil to generate a secondary voltage signal each time the circuit interrupter means is switched to the nonconductive state, and a distributor connected to the secondary winding for sequentially applying each generated secondary voltage signal to the igniter of a different cylinder in a predetermined sequence, the ignition coil test apparatus comprising:

test circuit means operatively connected across the circuit interrupter means to cause the circuit interrupter means to be effectively short-circuited each time the test circuit means is in a conductive state;

means for selectively causing the test circuit means to switch to its conductive state for a time interval beginning at a time when the circuit interrupter means is in its conductive state and ending at a time when the circuit interrupter means is in its nonconductive state and the distributor cannot apply secondary voltage to an igniter;

means for producing a first electrical signal which is a function of a secondary voltage generated in the secondary winding at the end of the time interval; and

means for providing an indication of condition of the ignition coil as a function of the first electrical signal.

22. A method of determining condition of an ignition coil of a multicylinder internal combustion engine having an ignition circuit including an igniter for each cylinder, the ignition coil, a circuit interrupter which is periodically switched between a conductive and a nonconductive state, and a distributor for sequentially applying a secondary voltage generated in the ignition coil to the igniter of a different cylinder in a predetermined sequence, the method comprising:

connecting a short circuit current path in parallel with the circuit interrupter during a time interval which begins at a time when the circuit interrupter is in its conductive state and ends at a time when the circuit interrupter is in its nonconductive state and the distributor cannot apply a generated secondary voltage to an igniter;

measuring a primary current through the short circuit current path;

measuring a secondary voltage generated at the end of the time interval; and

providing an indication of condition of the ignition coil as a

function of the measured primary current and the measured secondary voltage.

4,490,800

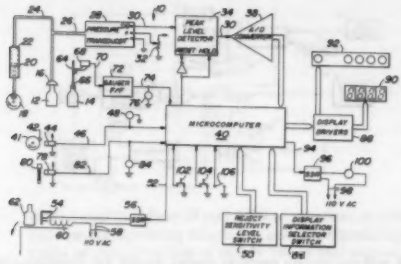
DUAL HEAD GAUGER APPARATUS WITH AUTOMATIC ADJUSTMENT FOR PRESSURE VARIATION

Whitney S. Powers, Pine City, N.Y., assignor to Powers Manufacturing, Inc., Elmira, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,297

Int. Cl.³ G01N *7/00*; G06G *7/12*; G06F *15/20*

U.S. Cl. 364—558 **14 Claims**



1. Apparatus for testing the sealing surface finish of containers at a test area through which the containers are sequentially transported, comprising:

(a) first means disposed at the test area for sealing the surface of the container with a flexible diaphragm, injecting a metered volume of gas into the container and providing a sample of the pressure existing in the container;

(b) second means coupled to the first means for producing a digital signal having a value indicative of the magnitude of the peak pressure existing in the container; and

(c) third means coupled to the second means for computing a running average value of selected ones of previously produced digital signals, calculating a threshold value based on a percentage of the running average value, comparing the most recently produced digital signal to the threshold value and producing a reject signal when the value of the most recently produced digital signal is less than the threshold value.

4,490,801

ARTICLE SIZING APPARATUS AND CONTAINER FILLING SYSTEM EMPLOYING THE SAME

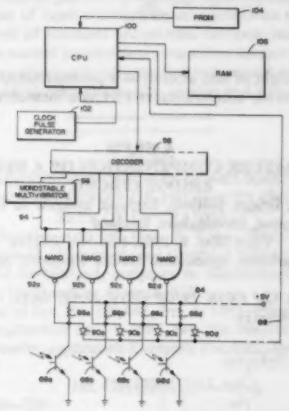
James C. Hagan, and Owen C. Hagan, both of Stockton, Calif., assignors to Hagan Engineering, Inc., Stockton, Calif.

Filed Jul. 6, 1982, Ser. No. 395,804

Int. Cl.³ G01N *9/02*

U.S. Cl. 364—564 **7 Claims**

1. Article sizing apparatus comprising a housing, said housing defining an opening for affording transport of an article to be measured therethrough, a plurality of first light sources mounted in said housing in a first linear array at one boundary of said opening for producing a plurality of first discrete light beams traversing said opening, a first opaque wall mounted adjacent another boundary of said opening in confronting relation to said light beams from said first array, said first wall having a plurality of slits therein that are spaced apart in correspondence to the spacing between said light sources in said first array, a plurality of first photodetectors for receiving light from said first light sources in said first array, first means for supporting said first photodetectors in said housing on the side of said opening opposite from said first light sources, said first supporting means supporting individual first photodetectors in alignment with respective said slits in said first wall so that each said first photodetector responds to light from only one of said first light sources, a plurality of second light sources mounted in said housing in a second linear array that is substantially orthogonal to said first array for producing a plurality of second discrete light beams traversing said opening substantially normal to said first light beams, a second opaque wall mounted on a boundary of said opening opposite said second linear array, said second wall having a plurality of slits therein that are spaced apart in correspondence to the spacing between said second light sources in said second array, a plurality of second photoconductors for receiving light from said second light sources in said second array, second means for supporting individual second photodetectors in alignment with said slits in said second wall so that each said second photodetector responds to light from only one of said second light sources, sensing means coupled to said photodetectors for sensing the identity of photodetectors that are in a condition illuminated by said light sources and the identity of photodetectors that are in a condition obscured by an article at each of a plurality of locations along the article as it traverses said opening, storage means coupled to said sensing means for storing plural signals representative of the identity and condition of each said photocell at each of said locations, and analyzing means coupled to said storage means for analyzing the signals stored in said storage means to produce a resultant parameter representative of the volume of said article.



4,490,802

TAKEOFF WEIGHT COMPUTER APPARATUS FOR AIRCRAFT

Harry Miller, Scottsdale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 333,098

The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.

Int. Cl.³ G01G *19/10*; G01N *19/02*

U.S. Cl. 364—567 **8 Claims**

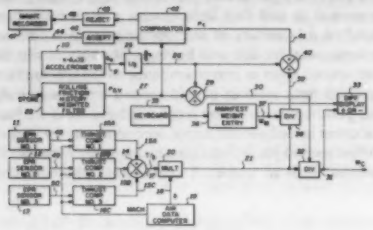
1. Apparatus for providing a measure of actual takeoff weight of an aircraft, comprising:

means for providing a measure of engine thrust of said aircraft,

means for providing a measure of longitudinal acceleration of said aircraft,

means for providing a measure of rolling friction of said aircraft, which measure is an average value of a plurality of rolling friction measures obtained over a plurality of prior aircraft takeoffs, and

means responsive to said measures of thrust, acceleration and friction for providing an output measure of said take-



off weight of said aircraft as a predetermined function of said thrust, acceleration and friction measures.

4,490,803

TEMPERATURE COMPENSATION OF A RESISTANCE BRIDGE CIRCUIT

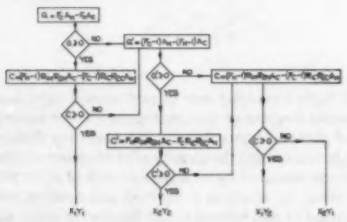
Stephen A. Briggs, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 9, 1982, Ser. No. 356,316

Claims priority, application United Kingdom, Apr. 3, 1981, 8110475

Int. Cl.³ G01K *19/00*; G01R *27/00*; G01L *1/22*

U.S. Cl. 364—571 5 Claims



2. A method of temperature compensation in a transducer responsive to an input quantity, wherein said transducer comprises four resistors arranged as a bridge circuit and four compensating resistances, first and second compensating resistances connectable in series and in parallel, respectively, with selected ones of two adjacent resistors in said bridge circuit and, third and fourth compensating resistances connectable in series with a voltage supply connection to said bridge circuit and in parallel with said bridge circuit, respectively, said compensating resistances providing the only temperature compensation elements so connected and having substantial constant values over the temperature range for which the transducer is to be compensated, said method comprising the steps of:

making measurements at a plurality of predetermined temperature levels, said measurements including the resistance values of two adjacent ones of said bridge resistors, the bridge output voltage at a zero level of said input quantity, the voltage levels at the separate output connections of the bridge circuit, and the bridge resistance;

determining from said measurements, the required connections to the bridge circuit of said first and second compensating resistances;

calculating, from said measurements, the values of said first and second resistances;

calculating, from said measurements and from a required value of the sensitivity of said bridge circuit, the values of said third and fourth compensating resistances; and

connecting compensating resistances having values of resistance corresponding to the calculated values at the determined locations in said bridge circuit.

4,490,804

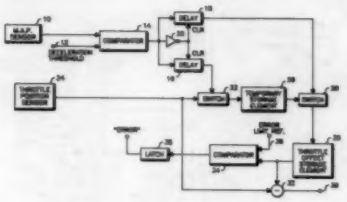
SELF-CORRECTING THROTTLE POSITION SENSING CIRCUIT

Robert Martinsons, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 3, 1982, Ser. No. 373,840

Int. Cl.³ G06F *15/20*; H04L *25/06*

U.S. Cl. 364—571 5 Claims



1. A self-correcting position sensor circuit for providing an output signal in response to the instantaneous position of a movable element with respect to a reference position and comprising:

first position sensor means adjacent said movable element for measuring the position of the element and providing a first sensor circuit signal in response to the instantaneous position of the element;

second sensor means for providing a second sensor signal in response to a parameter other than said measured position, said parameter having a predetermined value at said reference position;

comparator means coupled to the second sensor means for providing a first control signal in response to a determination that the second sensor signal is of the predetermined value;

storage means coupled to the first position sensor means for storing the first sensor signal;

switching control circuitry coupled to the comparator means and to the storage means and including switching means for controlling the storage of the first sensor signal in the storage means in response to the first control signal; and

subtracting means coupled to the first sensor means and to the storage means for subtracting the stored value of the first sensor signal from the instantaneous values of the first sensor signal and for providing said output signal.

4,490,805

HIGH SPEED MULTIPLY ACCUMULATE PROCESSOR

Poohsan N. Tamura, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 20, 1982, Ser. No. 419,667

Int. Cl.³ G06F *7/38*

U.S. Cl. 364—728 8 Claims

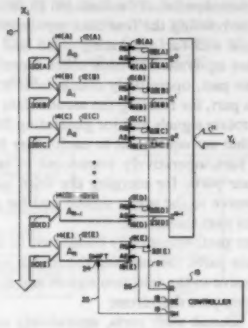
1. Apparatus for calculating the sum of the products of pairs of numbers, each of said pairs of numbers having a first member taken from a first set of numbers and a second member taken from a second set of numbers, each of said numbers of said first set being represented by M bit binary data and each number of said second set being represented by N bit binary data, said apparatus comprising:

a plurality of accumulator means, each of said accumulator means having a data port and an accumulator means select input terminating region;

a first data bus adapted to carry signals representative of said first members of said pairs of numbers, said first data bus

further adapted to provide said signals representative of said first members of said pairs of numbers to said data ports of said accumulator means; and

a second data bus adapted to carry signals representative of



said second members of said pairs of numbers, said second data bus further being adapted to provide signals representative of individual bits of said N bits of said second members of said pairs of numbers to said accumulator means select input terminating regions.

4,490,806

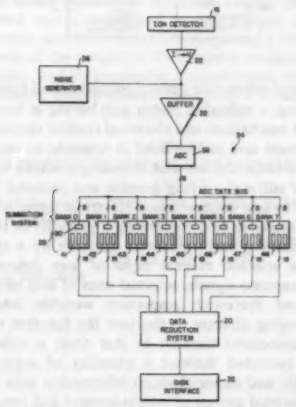
HIGH REPETITION RATE TRANSIENT RECORDER WITH AUTOMATIC INTEGRATION

Christie G. Enke; Bruce H. Newcome, both of East Lansing, and John F. Holland, Lansing, all of Mich., assignors to Research Corporation, New York, N.Y.

Filed Jun. 4, 1982, Ser. No. 385,115

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—734 **16 Claims**



1. A high speed data acquisition system for processing input data values representative of the magnitude of sequential, substantially repetitive transient signal waveforms, sampled for each occurrence at a plurality of sample points in time, comprising a data summation system for summing the data values in a predetermined number of individual time-resolved time bins over a number of sequential transient signal waveforms, with each time bin corresponding to a sample point, including a plurality of data summation subsystems arranged in parallel channels to each other, means for directing input data values to one data summation subsystem at a time and sequentially to all of the data summation subsystems such that each parallel channel data summation subsystem receives and stores input data values in a repetitive sequence, each parallel data summation subsystem including at least first and second parallel data summation subcircuits, each having a memory bank therein, and input switching means for directing the input data values associated with sequential transient waveforms first to all of said first parallel data summation subcircuits for a given number of input transient signal waveforms such that a given number of transient waveforms are summed and stored in the first parallel data summation subcircuits in data summing operations, and said input switching means next directing the input data values associated with sequential transient waveforms to all of said second parallel data summation subcircuits for a given number of input transient signal waveforms such that a given number of transient waveforms are next summed and stored in the second parallel data summation subcircuits in data summing operations, whereby the first and second parallel data summation subcircuits alternately receive and sum input data values.

4,490,807

ARITHMETIC DEVICE FOR CONCURRENTLY SUMMING TWO SERIES OF PRODUCTS FROM TWO SETS OF OPERANDS

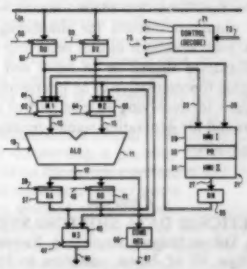
Pierre R. Chevillat, Adliswil; Hans P. Käser, Thalwil; Dietrich G. U. Maiwald, Wädenswil, and Gottfried Ungerböck, Langnau, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 270,447, Jun. 4, 1981, abandoned. This application Dec. 1, 1983, Ser. No. 556,760

Claims priority, application European Pat. Off., Jun. 24, 1980, 80103546.0

Int. Cl.³ G06F *7/48*

U.S. Cl. 364—736 **3 Claims**



1. Signal processor computing arrangement comprising:

a data source;

an arithmetic unit having two inputs and an output for performing at least add and substract operations;

a multiplier unit operating simultaneously with said arithmetic unit including two inputs and an output register, said output register receiving and storing a final product of the multiplication of a multiplicand and multiplier successively received on said two inputs;

two accumulator registers connected to said output of said arithmetic unit, said two accumulator registers including control means for selectively loading an alternate one of said two accumulator registers with successive outputs from said arithmetic unit output;

two input registers having outputs connected, respectively, to the two inputs of said multiplier unit, said two input registers including other control means for selectively loading said two input registers from said data source; and

gate means, including means for gating data from a selectable and alternate one of said two accumulator registers to

one of said arithmetic unit inputs, and for simultaneously gating the final product from said multiplier output register to the other of said arithmetic unit inputs;

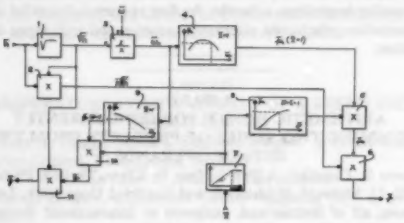
whereby two separate sum of products are developed in said two accumulator registers.

4,490,808

ELECTRONIC SIMULATOR FOR THE SIMULATION OF A HYDRO-TURBINE

Gilles Jasmin, Sherbrooke, Canada, assignor to Hydro Quebec, Montreal, Canada

Filed Mar. 31, 1982, Ser. No. 363,766
Claims priority, application Canada, Apr. 2, 1981, 374501
Int. Cl.³ G06F 7/62
U.S. Cl. 364—802 **38 Claims**



1. An electronic simulator responsive to simulated working conditions, for the analog simulation of a hydraulic turbine, comprising:

(a) first means for transforming said working conditions into standardized signals;

(b) second means for transforming said standardized signals by transfer functions, said second means including a plurality of simulator circuits for simulating said transfer functions, each simulator circuit receiving at least one of said standardized signals as an input and generating an output signal representative of an intermediary result; and

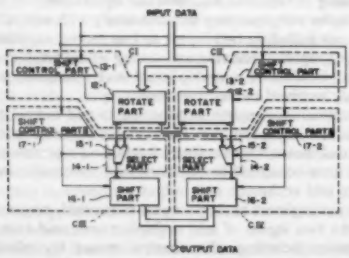
(c) third means for receiving at least part of said intermediary results and for generating signals representative of the turbine operation.

4,490,809

MULTICHIP DATA SHIFTING SYSTEM

Kohichi Ueda, Tokyo; Shigemi Kamimoto, Kawasaki, and Akira Miyata, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 22, 1980, Ser. No. 180,454
Claims priority, application Japan, Aug. 31, 1979, 54/111249
Int. Cl.³ G06F 9/00, 5/00
U.S. Cl. 364—900 **13 Claims**



2. A shift system operatively connected to receive input data having first and second data parts, said shift system comprising:

a shift control part for generating rotate signals, select signals and shift signals;

a first rotate part, operatively connected to receive the first data part, for rotating the first data part responsive to the rotate signals and for generating third and fourth data parts that are equivalent to each other therefrom;

a second rotate part, operatively connectable to receive the second data part, for rotating the second data part responsive to the rotate signals and for generating fifth and sixth data parts that are equivalent to each other therefrom;

a first select part, operatively connected to said first and second rotate parts, for merging the third and fifth data parts responsive to the select signals and for generating a seventh data part therefrom;

a second select part, operatively connected to said first and second rotate parts, for merging the fourth and sixth data parts responsive to the selection signals and for generating an eighth data part therefrom;

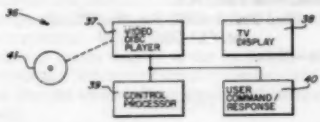
and first and second shift parts, operatively connected to said first and second select parts, respectively, for shifting the seventh and eighth data parts responsive to the shift signals.

4,490,810

AUTOMATED INSTRUCTION, GAME AND DATA RETRIEVAL SYSTEM

David C. Hon, 1450 NW. Woodbine Way, Seattle, Wash. 98177

Filed Feb. 16, 1982, Ser. No. 348,794
Int. Cl.³ H04N 5/76; G11B 31/00
U.S. Cl. 364—900 **20 Claims**

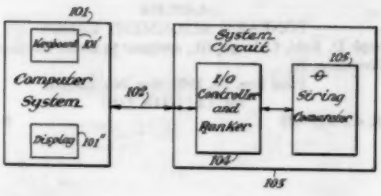


1. An automated interactive game, instruction and reference system comprising: a videodisc player unit having at least one pickup head and mechanical and electrical control elements to position and actuate said pickup head in response to received control signals; a video display unit including a screen for the visual display of still and moving graphic and pictorial information supplied to said display unit is electrical signal form; a user command/response unit comprising a plurality of switch elements and analog control elements operable by a system user to produce selected manual input of user determined command and response signals, selected ones of said elements having associated therewith respective variable labelling means for conveying directly to the user the function represented by the associated element at that time; a videodisc record having recorded thereon a plurality of segmented groups of graphic and pictorial video information data and a plurality of segmented groups of system control and programming data; control processor unit comprising distributor means having signal controllable electronic switching and multiplexing elements and adapted to receive information, control and programming signals from said videodisc record and user input signals from said command/response unit and in response to certain of said received signals to direct others of said received signals to said videodisc player unit, said video display unit, said user command/response unit and internally within said control processor for the operation and control of each of said units and of said control processor unit; and interconnection means providing signal flow paths between said units and said various means.

4,490,811
STRING COMPARATOR DEVICE SYSTEM CIRCUIT AND METHOD

Peter N. Yiasilos, 2807 NE. 36 St., and Samuel R. Buss, Apt. 205, 2700 NE. 51 St., both of Fort Lauderdale, Fla. 33308

Continuation-in-part of Ser. No. 20,518, Mar. 14, 1979, abandoned. This application Dec. 17, 1981, Ser. No. 331,631
Int. Cl.³ G06F *15/40*
U.S. Cl. 364—900 21 Claims



1. An indicia string comparator circuit for providing a numeric measurement of the degree of indicia string similarity between a record indicia string and a query indicia string, comprising;

first means including an output for presenting record string indicia and query string indicia alternately and for presenting control information at said output, said first means connected to a digital source of record string indicia and query string indicia,

read/write memory operably connected to a second means,

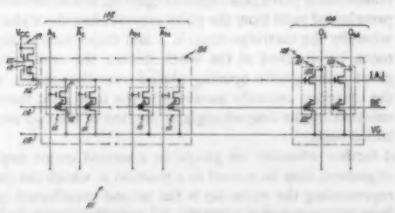
said second means having an input operably connected to said output of said first means, said second means having an output, said second means for reading from and writing to said read/write memory and for indicating at said output of said second means common portions of the indicia strings by generating control signals based on indicia counts, and

third means includes an input and output, said input of said third means connected to said output of said second means, said third means for computing a numeric measurement of the weight of the common portions of the indicia string, and for presenting a digital signal representing said numeric measurement at said output of said third means.

4,490,812
USER REPROGRAMMABLE PROGRAMMED LOGIC ARRAY

Daniel C. Guterman, Plano, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Sep. 30, 1982, Ser. No. 431,466
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 2 Claims



1. A programmable logic array comprising:

a plurality of pattern-matching modules, each of which is responsive to a predetermined pattern of input logical signals for generating a pattern recognition signal; and

a plurality of logical output modules, each of which is responsive to a pattern recognition signal from one of said plurality of pattern-matching modules, for outputting a plurality of predetermined output signals, characterized in that:

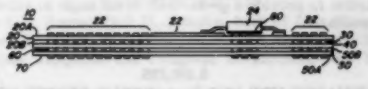
said pattern-matching modules and said logical output modules include a plurality of electrically alterable nonvolatile member elements for storing a predetermined input data pattern, which nonvolatile memory elements may be repeatedly altered; and

said predetermined pattern of input logical signals is written into said plurality of pattern-matching modules under the control of a self-indexing pointer circuit.

4,490,813
FREQUENCY DETERMINING APPARATUS FOR A SYNTHESIZED RADIO

Bernard V. Gasparaitis, Tamarac; Larry M. Krieg; Richard R. Schweet; William R. Williams, and Raymond W. Burbank, all of North Lauderdale, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 1, 1982, Ser. No. 353,728
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—63 12 Claims



1. An apparatus for containing information designating the frequency of operation of a synthesized radio frequency transceiver comprising:

a multilayer circuit board including upper and lower boards and at least one intermediate board disposed therebetween in sandwich-like relationship, said upper and lower circuit boards including exterior surfaces;

memory means, situated on the exterior surface of said upper board, for providing frequency data to a multibit output port of said memory means, when a multibit input port of said memory means is appropriately addressed;

connecting means, situated on the surfaces of said first and second boards and said at least one intermediate board, for electrically connecting a plurality of electrical contact pads situated on the exterior surface of said lower board to at least said input and output ports;

jumper means, situated on said exterior surface of said lower circuit board, coupling certain of said electrical contact pads together, said jumper means being selectively cuttable to control certain predetermined characteristics of the operation of said transceiver; and

a plurality of interconnecting means, situated on the exterior surface of said lower board, for selectively electrically interconnecting a portion of a first circuit external to said apparatus to a portion of a second circuit external to said apparatus.

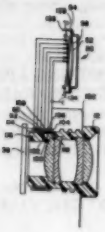
4,490,814
SONIC AUTOFOCUS CAMERA HAVING VARIABLE SONIC BEAMWIDTH

Edwin K. Shenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 429,820, Sep. 30, 1982, Pat. No. 4,440,482. This application Jan. 30, 1984, Ser. No. 574,885
Int. Cl.³ H04R *19/00*
U.S. Cl. 367—140 2 Claims

1. A capacitance-type combination transmitting and receiving ultrasonic transducer comprising a diaphragm, a backplate having a grooved surface for cooperative engagement with said diaphragm, and means for coupling a source of voltage to said diaphragm and said backplate, said grooved surface backplate having a plurality of electrically isolated segments, and

said coupling means including means for selectively interconnecting said segments to vary the effective diameter of said



backplate to provide a given sonic beam angle in accordance therewith.

4,490,815

ACTUATOR FOR USE IN A PICKUP DEVICE FOR A VIDEO DISK PLAYER

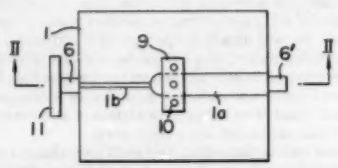
Teruo Umehara, Hazyu, and Norio Matsumoto, Kumagaya, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Oct. 30, 1981, Ser. No. 316,642

Claims priority, application Japan, Nov. 5, 1980, 55-155320; Apr. 17, 1981, 56-55636[U]

Int. Cl.³ G11B *9/06, 21/12;* H01F *7/08*

U.S. Cl. 369—43 **14 Claims**



1. An actuator for use in a pickup device for a video disk player, said actuator comprising:

a cylindrical yoke made from a soft magnetic material, said yoke being provided with an axially extending notch having an opening at one axial end of said yoke,

a pair of tubular solenoid coils disposed in said yoke such that when said pair of solenoid coils is energized the same polarity appears at adjacent portions thereof,

a movable element being disposed within said solenoid coils for axial movement, said movable element including an axially magnetized permanent magnet and a pair of pole shoes attached to the respective ends of said permanent magnet,

a pair of resilient members, each of said resilient members being respectively attached to opposite axial ends of said yoke,

a pair of projections, each of said projections being provided on the respective axial ends of said movable element to axially extend therefrom, said projections being respectively supported by said resilient members coaxially with said yoke,

a bobbin made from an insulating material and mounted in said yoke to enclose said solenoid coils, and

a terminal block projecting radially outward from said bobbin, said terminal block including a base portion and a terminal pin supporting portion being a width greater than a width of said base portion.

4,490,816

TONEARM ALIGNMENT GAUGE

Joseph D. Kehl, Chicago, Ill., assignor to Shure Brothers, Inc., Evanston, Ill.

Filed Sep. 27, 1982, Ser. No. 424,081

Int. Cl.³ G11B *3/10*

U.S. Cl. 369—55 **9 Claims**

1. An improved phonograph cartridge alignment gauge for positioning a phonograph cartridge on a pivotally supported tone arm of a phonograph having a turntable platter with a central spindle, such that the shank of a stylus normally mounted on the cartridge will be at a desired angle relative to the groove of a record placed on the turntable platter at two preselected radii from the center of the spindle, thereby adjusting the weighted lateral tracking error for any tone arm pivot-to-spindle distance, comprising:

(a) a plate defining a combination pivot point-spindle opening having a center;

(b) a work station affixed on the plate and adapted to receive the phonograph cartridge, the work station being positioned on the plate so that a point representing the tip of the stylus normally mounted on the received cartridge is a first of the two preselected radii from the center of the combination pivot point-spindle opening and a first line representing the shank of the stylus normally mounted on the received cartridge is the desired angle relative to a second line defined by the point and the combination pivot point-spindle opening; and

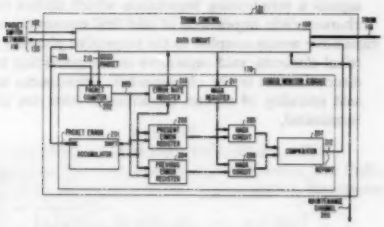
(c) means on the gauge for linearly aligning (i) the point representing the stylus tip, (ii) the center of the combination pivot point-spindle opening, and (iii) the center of the turntable spindle while the turntable spindle is outside the combination pivot point-spindle opening and is the second preselected radii from the point representing the stylus tip whereby the cartridge may, in a first major step of alignment, be received at the work station, the combination pivot point-spindle opening placed over the spindle, and the cartridge securely mounted to the tone arm, thereby establishing the desired angle at the first of the two preselected radii;

and further whereby the gauge, in a second major step of alignment, may be moved to a position at which the point representing the stylus tip is the second preselected radii from the center of the spindle, the cartridge loosened, the gauge pivoted about the center of the combination pivot point-spindle opening until the point, center of the opening and center of the spindle are aligned, and the cartridge again securely mounted, thereby establishing the desired angle at the second of the two preselected radii while maintaining the desired angle at the first such radii.

4,490,817
PACKET ERROR RATE MEASUREMENTS BY DISTRIBUTED CONTROLLERS

Jonathan S. Turner, Evanston, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 13, 1982, Ser. No. 449,553
Int. Cl.³ H04J 3/14
U.S. Cl. 370—17 28 Claims



1. An error monitoring arrangement for measuring the rate of errors occurring in the transmission of packets, comprises:

means for generating error signals upon detection of errors in ones of said packets;

means responsive to said error signals for calculating present error signals representing an error rate;

means for generating a control signal upon receipt of a predetermined number of packets;

means for storing reference error signals;

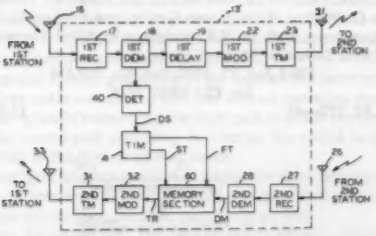
means cooperating with said calculating means and said storing means for defining error rate thresholds; and

means cooperating with said defining means, said calculating means, and said storing means in response to said control signal for indicating error rate excursions beyond said thresholds by said present error signals from said reference error signals.

4,490,818
REPEATER STATION FOR USE IN A RADIO RELAY SYSTEM TO PROTECT TIME DEVIATIONS OF TIME SLOTS

Shigeru Otsuka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 19, 1983, Ser. No. 486,384
Claims priority, application Japan, Apr. 20, 1982, 57-66934
Int. Cl.³ H04L 5/14; H04B 3/36
U.S. Cl. 370—26 2 Claims



1. A repeater station for repeating a first sequence of downward time slots from a first station to a second station as a second sequence of downward time slots and for transmitting a first succession of upward time slots to said first station in response to a second succession of upward time slots received from said second station, a particular downward time slot in each of said first and said second sequences comprising a synchronizing signal, a particular upward time slot in each of said first and said second successions corresponding to said particular downward time slot, each of said downward and said upward time slots having a predetermined length except for said particular downward and upward time slots, said repeater station including detecting means for detecting the synchronizing signal included in said first sequence to produce a detection signal, wherein the improvement comprises:

timing signal producing means responsive to said detection signal for producing a first and a second timing signal when a first predetermined duration lapses after detection of the synchronizing signal included in said first sequence and when a second predetermined duration lapses after production of said first timing signal, respectively;

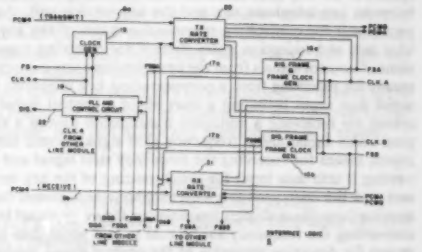
memory means coupled to said timing signal producing means and responsive to the first timing signal for memorizing information carried in the upward time slots of said second succession; and

reading means responsive to said second timing signal for reading the upward time slot information memorized in said memory means to produce the upward time slots of said first succession.

4,490,819
RATE CONVERTER

Leonard E. Bogan; Paul H. Knapke, both of Columbus, and Robert L. Miller, Westerville, all of Ohio, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 22, 1982, Ser. No. 370,608
Int. Cl.³ H04J 3/02
U.S. Cl. 370—84 14 Claims



1. A rate conversion arrangement for interfacing first and second time-division multiplex lines each operating at a first data rate to a time-division multiplexed bus operating at a second data rate, said second data rate being a multiple of said first data rate, each of said lines carrying a plurality of frame organized PCM channels each frame having a first number of channels, each of said channels comprising a predetermined number of data bits, said arrangement comprising:

first memory means for storing data bits;

second memory means for storing data bits;

first receiving means for receiving first data bits from said first line at said first data rate;

second receiving means for receiving second data bits from said second line at said first data rate;

first storing means for storing said first data bits in said first memory means;

second storing means for storing said second data bits in said second memory means;

first reading means for reading said stored first data bits for one channel from said memory means;

second reading means for reading said stored second data bits for another channel from said second memory means;

means for transmitting said read first data bits and said read second data bits over said bus at said second data rate,

said read first data bits for said one channel and said read

second data bits for said another channel being transmitted in a predetermined sequence; and

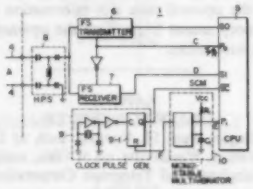
second means for receiving data bits at said second rate from said bus and for transmitting data bits from first predetermined channels of said bus in sequential channels of said first line at said first data rate and for transmitting data bits from other predetermined channels of said bus in sequential channels of said second line at said first data rate.

4,490,820

RECEPTION SYSTEM FOR KEY TELEPHONE SYSTEM

Akiho Doi, and Norio Saneyoshi, both of Tokyo, Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,315
Claims priority, application Japan, Aug. 3, 1981, 56-120686
Int. Cl.³ H04J 3/06
U.S. Cl. 370—100 **4 Claims**



1. In a key telephone system having a key service unit, a plurality of key telephone sets, intercom lines connecting the key telephone sets and the key service unit, a synchronization system in the key service unit for synchronizing transmissions between key telephone sets and the key service unit, the improvement for controlling transmission states of the key service unit and reception states thereof for receiving transmissions of control signals from the key telephone sets comprising,

means for receiving from a corresponding key telephone set a serial data input including a start bit of a control signal and means for receiving a multiplex transmission having a multiplex voice signal and a frequency shift signal as said control signal, means for receiving the frequency shift signal and converting it into data input for synchronizing of the key service unit and the corresponding key telephone sets, means for removing from the multiplex transmission the voice signal before converting the frequency shift signal to said serial data input, means for detecting reception of the control signal, means for responding to said detection of the control signal and for extending by a period of time a period for effecting initiation of a period at termination of a state of transmission of the key service unit and start of a reception state for receiving transmissions from the corresponding key telephone sets to insure synchronization of the transmissions between the key service unit and the key telephone sets.

4,490,821

CENTRALIZED CLOCK TIME ERROR CORRECTION SYSTEM

William A. Lacher, Lansdale, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 13, 1982, Ser. No. 448,964
Int. Cl.³ G06F 11/00
U.S. Cl. 371—1 **14 Claims**

1. A time skew correction system for effecting uniformity in the delays incurred by timing signals traversing a plurality of signal paths comprising:

a source of said timing signals having output terminal means and including means for selectively switching said timing signals ON and OFF,

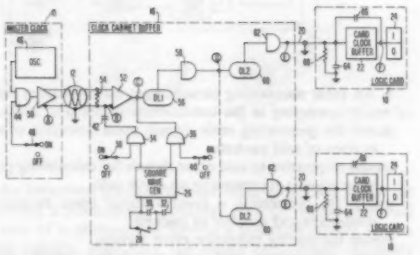
a plurality of electrical elements each having respective pluralities of input and output terminals,

buffer means centrally disposed with respect to said source of timing signals and said plurality of electrical elements, said buffer means having input terminal means and a plurality of output terminals,

a first transmission line coupling the output terminal means of said source of timing signals to said input terminal means of said buffer means, a plurality of second transmission lines coupling said plurality of output terminals of said buffer means respectively to said plurality of input terminals of said electrical elements,

said output terminal means of said source of timing pulses providing in response to the switching OFF of said timing signals a terminating impedance which differs from the characteristic impedance of said first transmission line,

capacitive means coupled to the respective plurality of electrical elements, said capacitive means providing transient discontinuities in the characteristic impedances in which said plurality of second transmission lines are normally terminated,



generator means for selectively applying square wave pulses to said input terminal means of said buffer means and in common to all of said plurality of output terminals of the buffer means, the resultant reflected pulses appearing respectively on the last mentioned input terminal means and the plurality of output terminals providing a measure of the delays in said first transmission line and in each of said plurality of second transmission lines and its associated electrical element,

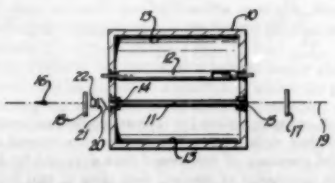
delay line means included in said buffer means and disposed in said plurality of signal paths for adjusting the signal delay from said output means of said source of timing signals to the plurality of output terminals of said electrical elements to the same predetermined worst case maximum amount.

4,490,822

CR-DOPED YTTRIUM GALLIUM GARNET LASER

John C. Walling, White House Station, and Michael L. Shand, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 17, 1982, Ser. No. 389,316
Int. Cl.³ H01S 3/16
U.S. Cl. 372—41 **11 Claims**



1. A laser comprising:

a laser medium comprising a single crystal of $Y_3Ga_5O_{12}:Cr^{3+}$, in which the Cr^{3+} concentration is in the

range between about 0.005 and about 20 atom percent with respect to gallium sites,

pump means for exciting the laser medium to emit coherent radiation, and

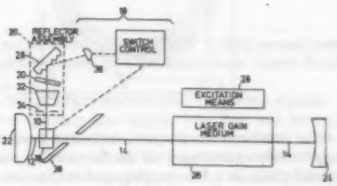
an optical resonant cavity for supporting coherent radiation emitted by the laser medium.

4,490,823

INJECTION-LOCKED UNSTABLE LASER

Hiroshi Komine, Torrance, and Stephen J. Brosnan, San Pedro, both of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Filed Mar. 7, 1983, Ser. No. 472,704
Int. Cl.³ H01S 3/08
U.S. Cl. 372—95 **1 Claim**



1. An injection-locked unstable laser for producing a laser beam in an unstable resonator whose spatial and temporal characteristics conform with those of a laser beam from a stable resonator, comprising:

first, second and third reflectors;

means for permitting propagation of light along first, second and third optical propagation paths between the first, second and third reflectors, respectively, and a point of intersection of the three paths, the three propagation paths having respective optical path lengths and the three reflectors having respective focal lengths such that optically connecting the first and third paths at said intersection point causes the first and third reflectors and the first and third paths therebetween to constitute a stable resonator cavity, and optically connecting the second and third paths at said intersection point causes the second and third reflectors and the second and third paths therebetween to constitute an unstable resonator cavity;

an optical switch, positioned at the intersection point of the three paths and having first and second operating modes, for optically connecting the third path to either the first or the second path according to whether the switch is operating in the first or second mode;

a laser gain medium positioned within the third propagation path between the optical switch and the third reflector;

means for exciting the laser gain medium; and

means for controlling the optical switch so that, when the laser gain medium is excited, the switch initially operates in the first mode and subsequently operates in the second mode;

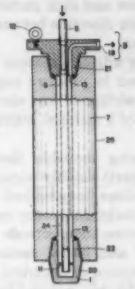
whereby the laser initially operates in a stable mode producing laser light, and subsequently operates in an unstable mode producing laser light whose spatial and temporal characteristics conform with those of the light produced in the stable mode.

4,490,824

COMPOSITE ELECTRODE FOR ARC FURNACE

Martin M. Turban, Lewiston; Lyman T. Moore, Niagara Falls, and Mark D. Travers, Ransomville, all of N.Y., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Jul. 15, 1983, Ser. No. 514,267
Int. Cl.³ H05B 7/08
U.S. Cl. 373—93 **9 Claims**



1. A liquid cooled electrode for use on an electric arc furnace comprising:

a. a main structure consisting of a graphite tube having threaded sockets at each end;

b. a metal header at one end having a coolant supply inlet and outlet;

c. a hollow metal nipple at the other end;

d. a coolant supply pipe from said header traversing the bore of said tube into the interior of said nipple, the outside diameter of said pipe being substantially less than the inside diameter of said tube;

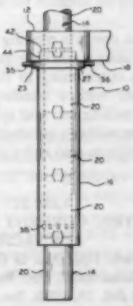
e. said tube being usable as a tip electrode after normal life as a composite electrode by disassembly and removal of said header, pipe and nipple and reattachment to a nipple.

4,490,825

WATER-COOLED ELECTRODE

John A. Persson, Gibsonia, Pa., assignor to Lectromelt Corporation, Pittsburgh, Pa.

Filed Sep. 27, 1982, Ser. No. 424,572
Int. Cl.³ H05B 7/12
U.S. Cl. 373—96 **15 Claims**



1. A water-cooled electrode assembly comprising an elongate electrode having an unthreaded outer surface and an open-ended cooling jacket means surrounding said electrode, said electrode having upper and lower ends extending outwardly from the open ends of said jacket means,

said jacket means including an inner wall portion disposed in spaced relation from said electrode,

an outer shell portion spaced from the inner wall portion and joined thereto adjacent its upper and lower ends to define a cooling fluid space therebetween,

baffle means mounted in said space in a fixed relation to said inner wall section and said outer shell portion to define passages of fixed length for cooling fluid flow in a first direction between said shell portion and said baffle means and in an opposite direction between said baffle means and said wall portion,

conductive inserts affixed adjacent the lower end of said jacket means and in pressure engagement with the unthreaded outer surface of said electrode,

said inserts being of a material which is harder than that of said electrode,

said electrode being movable linearly past said inserts whereby said inserts slidably engage said electrode in firm contact to machine longitudinal grooves in the outer surface of said electrode thereby maintaining good electrical contact between the electrode and the inserts,

the upper end of said jacket means being adapted to be connected to a source of electrical energy and being of an electrically conductive material for shunting electric current around the upper portion of said electrode and for transferring the same to said electrode at said inserts.

4,490,826

METHOD OF RESETTING ANODE SPIKE

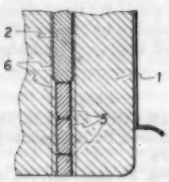
Yutaka Kawamata, Tokyo, and Akira Matsuo, Ebina, both of Japan, assignors to Mitsubishi Light Metal Industries Limited, Tokyo, Japan

Filed May 19, 1982, Ser. No. 379,708

Claims priority, application Japan, Jun. 2, 1981, 56-84700

Int. Cl.³ C25C *3/06*; H01J *1/02*

U.S. Cl. 373—97 **3 Claims**



1. A method of resetting an anode spike in a vertical type Söderberg electrolytic furnace for aluminum, comprising the steps of:

inserting at least one non-melting unbaked paste block prepared by molding a packing paste under pressure into a configuration conforming to that of the top end of said spike, together with a bonding paste, into a spike pit formed after pulling out said spike from an anode having an upper layer without substantial flowability; and

resetting said spike in said spike pit.

4,490,827

FEEDING ELECTRIC CURRENT TO TWIN-VESSEL ARC FURNACES

Gerd Dikta, Grefrath, Fed. Rep. of Germany, assignor to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 18, 1983, Ser. No. 514,573

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1982, 3225514

Int. Cl.³ H05B *7/11*

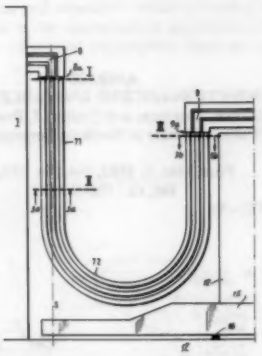
U.S. Cl. 373—103 **3 Claims**

1. A current feed system between a transformer and a cover provided for cooperation with two metallurgical vessels and carrying three electrodes, there being means for pivotting the cover about a vertical axis as between covering positions on each of the two vessels, comprising:

a current bus system extending from the transformer and defining three connect points arranged in an equilateral triangle in a first horizontal plane;

three electric conductor means, each including a first section extending down from the three connect points in the first plane, at least to a second horizontal plane;

means for holding the three conductors in a triangular fashion in the second plane underneath the first plane, the pattern also being an equilateral triangle, wherein the conductors extend through the corners of the triangle;



the three conductor means each including a second section respectively extending from the first section and from the second plane in a free sagging and suspension to a third plane;

means in the third plane providing three connect points to the three conductors and being arranged in an equilateral triangle configuration, the latter triangle being such that its sides respectively run parallel to the sides of the triangle in the second plane; and

current bar connection means running from the three connect points in the third plane to the electrodes on the cover.

4,490,828

ELECTRIC RESISTANCE HEATING ELEMENT AND ELECTRIC RESISTANCE HEATING FURNACE USING THE SAME AS HEAT SOURCE

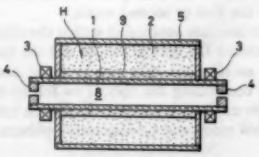
Mototada Fukuhara; Keizo Ono, both of Ehime; Ken-ichi Morita, Fujisawa, and Shigeru Fujii, Ehime, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 20, 1982, Ser. No. 451,391

Claims priority, application Japan, Dec. 18, 1981, 56-203460; Feb. 12, 1982, 57-21291

Int. Cl.³ H05B *3/40*

U.S. Cl. 373—117 **16 Claims**



8. An improved electric resistance heating furnace comprising a carbonaceous electric resistance heating tube having a heat treatment chamber therein along the center axis of said

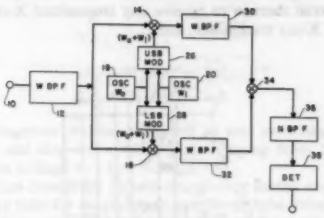
tube, a layer of carbon fiber closely wound on an outer surface thereof substantially perpendicularly to said axis and a thermal insulating material said layer.

4,490,829

DETECTION OF ANGULAR MODULATED ELECTROMAGNETIC SIGNALS

Paul Van Etten, Clinton, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 30, 1982, Ser. No. 445,646
Int. Cl.³ H04K 1/04
U.S. Cl. 375—1 **6 Claims**



1. A signal processing circuit for detecting spread spectrum radio frequency signals at a predetermined output frequency comprising:

a source of spread spectrum radio frequency signals;

means for splitting said signals into first and second part signals on first and second paths, respectively;

first local oscillator means for generating a radio frequency output signal of frequency equaling the center frequency of said spread spectrum signals;

second local oscillator means for generating a radio frequency output signal of frequency one-half said predetermined output signal center frequency;

first single sideband modulator means connected with said first and second local oscillator means for generating from said first and second local oscillator means outputs, a summation frequency output signal;

second single sideband modulator means connected with said first and second local oscillator means for generating from said first and second local oscillator means outputs, a difference frequency output signal;

first mixer means for mixing said first part signal and said summation frequency signal to form a first mixer output signal;

second mixer means for mixing said second part signal and said difference frequency signal to form a second mixer output signal; and

third mixer means for mixing said first and second mixer output signals to form a resultant output signal at said predetermined center frequency.

4,490,830

RADIO SIGNAL TRANSMISSION SYSTEM INCLUDING A PLURALITY OF TRANSMITTERS FOR TRANSMITTING A COMMON SIGNAL

Tomokazu Kai, and Toshihide Tsuboi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1982, Ser. No. 396,581
Claims priority, application Japan, Jul. 22, 1981, 56-114766
Int. Cl.³ H04B 7/02
U.S. Cl. 375—40 **6 Claims**

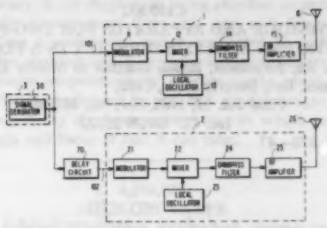
1. A radio signal transmission system wherein first and second transmitters transmit a common data signal with first and second carrier waves of the substantially identical frequency to first and second radio zones having an overlapping zone therebetween, said transmission system comprising:

(a) first means for generating said common data signal;

(b) second means coupled to said first means for phase delaying said common data signal to provide a delayed common data signal;

(c) third and fourth means for generating said first and second carrier waves, respectively;

(d) fifth and sixth means for angle-modulating said first and



second carrier waves with said common data signal and said delayed common data signal, respectively; and

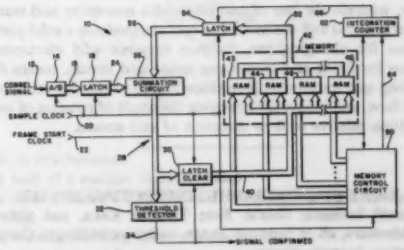
(e) seventh and eighth means coupled to said fifth and sixth means for transmitting said angle-modulated first and second carrier waves, respectively, whereby said angle-modulated first and second carrier waves combine in said overlapping zone to provide a common data signal of a low code error rate.

4,490,831

DIGITAL PULSE DETECTOR CIRCUIT HAVING SELECTABLE FALSE ALARM RATE

Billy R. Poston, and Stuart L. Atkinson, both of St. Petersburg, Fla., assignors to E Systems, Inc., Dallas, Tex.

Filed Mar. 1, 1983, Ser. No. 471,220
Int. Cl.³ H04L 27/06
U.S. Cl. 375—94 **7 Claims**



1. A method for detecting a repeated pulse in an input signal existing in a noisy environment, comprising the steps of:

sampling said input signal during sequential time slots in a repeated time frame to produce a sequence of input samples;

processing each said input sample with a stored processed sample for the corresponding time slot to that of the input sample to produce a corresponding new processed sample;

storing each of the new processed samples in place of the stored processed sample for the corresponding time slot;

comparing each new processed sample with a threshold value;

generating an output signal when one of the new processed samples reaches the threshold value;

setting the stored processed sample to an initial state when

the new processed sample for the corresponding time slot has reached the threshold value; and

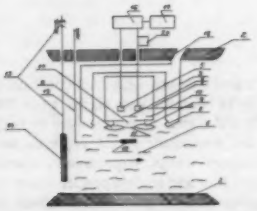
setting the stored processed sample to an initial state when the new processed sample for the corresponding time slot has not reached the threshold value after a set number of steps of processing each input sample have occurred for that time slot.

4,490,832

TECHNIQUE AND APPARATUS FOR TWO-PHASE SYSTEMS ANALYSIS DIRECTLY IN A FLOW

Emil A. Ah, Jerusalem, Israel, assignor to Middle East Trade Alliance, Inc., Beverly Hills, Calif.

Filed Jul. 12, 1982, Ser. No. 397,043
Int. Cl.³ G01N *23/22*
U.S. Cl. 378—47 **19 Claims**



1. Apparatus for X-ray spectrum analysis of flowing material having solid and liquid phases directly in a stream of such material comprising: a portable transducer placed directly inside said stream, power supply and recording units connected to said transducer and positioned outside said stream, said portable transducer comprising a casing with a window, a primary X-radiation source, a detector, X-ray filters, means for shifting said filters, a system of nozzles for producing a gas cushion across said window, a moveable flap covering said window in the absence of said cushion, a plane capacitor having two electrodes positioned parallel to said transducer window, wherein the one of said electrodes nearest to said transducer is a grid and the second of said electrodes is a solid plate, means for changing the distance between said electrodes, means for fixing said transducer inside said stream, means for shifting said transducer, a partition in said stream for retarding said flow, and means for changing the angle of rotation of said partition relative to flow direction of said stream.

4,490,833

X-RAY PHOTOGRAPHIC INSPECTING DEVICE

Masashi Inomata; Shizuo Kon; Tsukasa Kaku, and Shizuo Shinohara, all of Sapporo, Japan, assignors to Hoxan Corporation, Sapporo, Japan

Filed Nov. 14, 1983, Ser. No. 550,726
Claims priority, application Japan, Sep. 12, 1980, 55-126670
Int. Cl.³ G03B *41/16*
U.S. Cl. 378—58 **1 Claim**

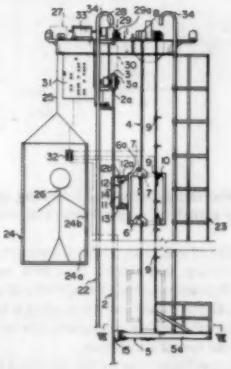
1. A weld flaw-detection apparatus using X-ray photography, where the X-ray apparatus is to be positioned on one side of a high wall, and operated by a technician who will enable the apparatus to send an X-ray beam through the wall to a film positioned on the other side of the wall, said apparatus comprising in combination:

(a) a movable housing (1) with an upper and lower end, a positioning section at said upper end for positioning at the upper edge of a wall having welds therealong which are to be examined for flaws, including support means for supporting said housing (1);

(b) a vertical guide rail (4) so disposed as to extend down from said housing (1) on one side of said wall, movable and adjustable limit switches (9) for positioning along said guide rail (4) at predetermined positions;

(c) a transmitter support (13) including drive means, elevationally and movably hung on said guide rail (4), an X-ray generator (6) generating penetrating X-rays, and an X-ray transmitter (11), coupled to said generator, on said support (13), said X-ray transmitter being disposed for beaming penetrating X-rays through the wall at said perdetermined positions where welds are located so as to determine if there are flaws in said welds;

(d) a lead-shielded movable gondola (24) for holding an operator including cable means (25) connected to the housing (1), said gondola being arranged to be disposed on the side of the wall opposite said transmitter (11), a door on said gondola openable towards the wall to place a film material thereon to receive any transmitted X-rays from said X-ray transmitter; and,



(e) a supporting leg (5) of U-shape configuration at the lower end of said housing, said supporting leg having leg frame means (5*a*) with inner ends which are to be placed opposite said wall, a pair of magnets (15) at said inner ends disposed to engage the wall to be inspected, a guide rail (4) across said leg frame means (5*a*), a first pivot (20) on said guide rail (4), a cylinder (21) having a pivoted end, pivoted to said first pivot (20) and an output piston shaft (21*a*), telescoped into said cylinder (21), said output shaft having an output end, a second pivot (19) on said leg frame means (5*a*), an arm (18) with one end pivoted to said second pivot (19) and the other end being connected to said output end, a wheel (17), journaled on said arm (18) between said leg frame means (5*a*) so that when said output shaft (21*a*) extends out of the cylinder (21) it pushes said wheel against the wall to be examined, separating the magnets (15) from contact with the wall.

4,490,834

X-RAY APPARATUS

Yasuo Sudani, Misato, Japan, assignor to Tokyo Emix Corporation, Japan

Filed Aug. 3, 1982, Ser. No. 404,695
Int. Cl.³ H05G *1/30*
U.S. Cl. 378—110 **8 Claims**

1. An X-ray apparatus for driving an X-ray tube having specified tube voltage and filament voltage ratings and suitable for generating X-rays, comprising:

(a) line voltage output means for producing a line voltage of predetermined frequency;

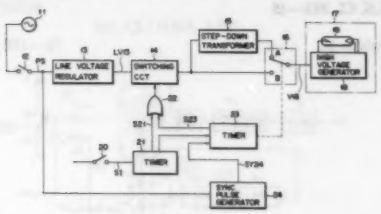
(b) means for outputing a first timer signal of a first predetermined time in response to a start signal;

(c) means for producing a second timer signal of a second predetermined time in synchronization with the phase of

the line voltage after the stoppage of the output of the first timer signal;

(d) switching means connected to said line voltage output means and closed by the first and second timer signals for passing the line voltage;

(e) means connected to said switching means for stepping down the line voltage passing through said switching means;



(f) changeover means connected to said switching means and said step-down means for changing from the step-down voltage to a line voltage; and

(g) means connected to said changeover means and to said X-ray tube for supplying to said X-ray tube, tube voltage and filament voltage corresponding to the stepped-down line voltage as preheating voltages, and rated tube voltage and filament voltage corresponding to said line voltage as X-ray radiation voltages.

4,490,835
X-RAY EXAMINATION DEVICE EMPLOYING DOUBLE-SLIT BEAM COLLIMATION

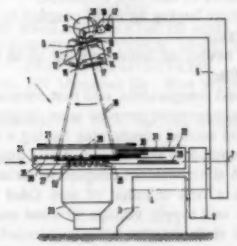
Heinz Wons, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,398

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138939

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—146 **11 Claims**



1. An X-ray examination device comprising:

an X-ray tube;

a primary X-ray diaphragm disposed in front of and close to the focus of said X-ray tube,

said primary X-ray diaphragm including means defining a first slit diaphragm for collimating radiation from said X-ray tube;

a patient support bed;

an X-ray exposure table disposed behind said patient support bed in the radiation direction, said exposure table having an X-ray image carrier, a displaceable stray radiation screen movable in front of said image carrier in and out of the radiation field, and a second slit diaphragm disposed above said image carrier formed by two displaceable diaphragm plates and a means for adjusting the spacing between said diaphragm plates to a minimum diaphragm plate spacing which corresponds to the width of the slit in said first slit diaphragm;

a drive means connected to said X-ray tube and to said second slit diaphragm for synchronously moving said X-ray tube, said first slit diaphragm, and said second slit diaphragm in fixed alignment in a sweep across said patient support bed in a direction perpendicular to the slits in said first and second slit diaphragms; and

said primary X-ray diaphragm being attached to said X-ray tube for comovement therewith, and said drive means including a positioning motor connected to said X-ray tube for pivoting said X-ray tube and said primary X-ray diaphragm perpendicularly relative to the plane of the radiation beam formed by said first slit diaphragm in said primary X-ray diaphragm about an axis which proceeds through said focus of said X-ray tube.

4,490,836
SHUT-OFF VALVE

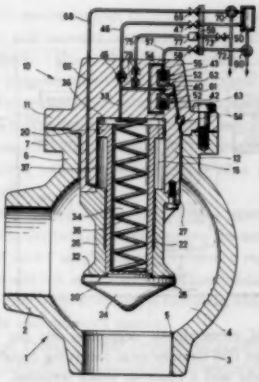
Karlheinz Grotloh, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 8, 1981, Ser. No. 328,703

Claims priority, application Switzerland, Dec. 19, 1980, 9394/80

Int. Cl.³ G21C *9/00*

U.S. Cl. 376—281 **10 Claims**



6. In combination,

a wall of a nuclear reactor plant;

a shut-off valve within said wall, said shut-off valve comprising

a housing defining a valve chamber;

a cover mounted on said housing and defining a cylinder;

a valve stem having a lid at one end and a piston at an opposite end slidably disposed in said cylinder to divide said cylinder into a first chamber on one side of said piston and a second chamber on an opposite side of said piston;

a first duct extending from said first chamber through said cover;

a second duct of fixed minimum cross-section extending from said second chamber through said cover;

a third duct extending from said valve chamber through said cover to said first chamber;

a fixed throttle means in said first duct;

at least one control valve in said third duct;

a first connecting line extending from said first duct through said wall;

a second connecting line extending from said second duct through said wall;

a third connecting line extending from said control valve through said wall for controlling said control valve;

a low-pressure chamber outside said wall and connected to said first connecting line and said second connecting line;

a first closing valve in said first connecting line adjacent and within said wall to selectively connect said first chamber to said low-pressure chamber; and

a second closing valve in said second connecting line adjacent and within said wall to selectively connect said second chamber to said low-pressure chamber.

4,490,837

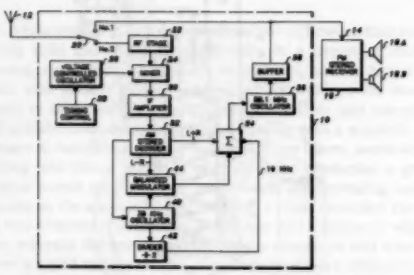
AM STEREO TO FM STEREO CONVERTER

Gregory J. Buchwald, Milwaukee, Wis., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 30, 1982, Ser. No. 412,615

Int. Cl.³ H04H 5/00

U.S. Cl. 381—15 **14 Claims**



1. An AM stereophonic converter for use in a receiver having at least FM stereophonic receiving capability and having an antenna and a receiver input terminal, the converter comprising:

switching means coupled to the antenna and having a first mode wherein the antenna is coupled to the receiver input terminal and having a second mode to be used at least when receiving AM stereophonic signals;

input circuitry connected to the switching means for being coupled to the antenna in the switching means second mode, the input circuitry including means for deriving from received, broadcast AM stereophonic signals, a corresponding intermediate frequency signal;

decoder means coupled to receive the IF signal and to derive therefrom a pair of stereo signals;

first oscillator means for providing two subcarrier signals;

modulator means coupled to the decoder means and the first oscillator means for modulating at least one stereo signal onto a first subcarrier signal;

combining means for combining at least the modulated subcarrier signal and a second subcarrier signal;

second oscillator means for providing a carrier signal and coupled to the combining means for frequency modulation of the carrier signal by the combined signals; and

means for coupling the output of the second oscillator means to the receiver input terminal of the FM receiver.

4,490,838

MUTING CIRCUIT FOR AM STEREOPHONIC RECEIVER

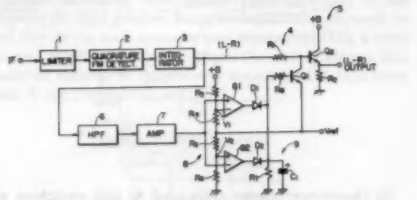
Akira Nishioka, and Hitoshi Hirata, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 232,065, Feb. 5, 1981,. This application Jul. 15, 1983, Ser. No. 513,788

Claims priority, application Japan, Feb. 6, 1980, 55-13272

Int. Cl.³ H04H 5/00

U.S. Cl. 381—15 **1 Claim**



1. A sub-channel receiving circuit for an AM stereophonic receiver in which a subsignal is phase modulated onto a carrier signal, comprising;

a limiter having an input coupled to receive an IF signal;

an FM detector having an input coupled to an output of said limiter;

an integrator having an input coupled to an output of said FM detector;

a first resistor having a first terminal coupled to an output of said integrator;

a second resistor;

a first transistor having a base coupled to a second terminal of said first resistor, a collector coupled to a supply voltage terminal, and an emitter coupled through said second resistor to ground, an L−R output signal being produced on said emitter of said first transistor;

a high-pass filter having an input coupled to said output of said integrator;

an amplifier having an input coupled to an output of said high-pass filter;

first and second comparators, said first comparator having a positive input terminal coupled to an output of said amplifier and said second comparator having a negative input terminal coupled to said output of said amplifier;

third through sixth resistors coupled in series with one another with a first terminal of said third resistor being coupled to said supply voltage terminal and a first terminal of said sixth resistor being connected to ground, a negative input of said first comparator being coupled to a junction point of said third and fourth resistors and a positive input of said second comparator being coupled to a junction point of said fifth and sixth resistors;

first and second diodes having anodes coupled, respectively, to outputs of said first and second comparators, and cathodes coupled together;

a seventh resistor coupled between said cathodes of said diodes and ground;

a capacitor coupled in parallel with said seventh resistor;

an eighth resistor; and

a second transistor having a collector coupled to said base of said first transistor, an emitter coupled to a junction point of said fourth and fifth resistors and a base coupled through said eighth resistor to said cathodes of said diodes.

4,490,839
METHOD AND ARRANGEMENT FOR SOUND ANALYSIS

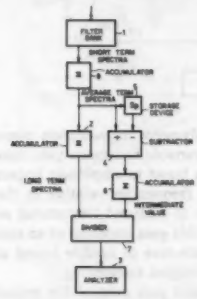
Ernst Bunge, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 107,222, Dec. 20, 1979, abandoned, which is a continuation of Ser. No. 902,928, May 5, 1978, abandoned. This application Feb. 3, 1983, Ser. No. 463,414

Claims priority, application Fed. Rep. of Germany, May 7, 1977, 2720666

Int. Cl.³ G10L 1/00

U.S. Cl. 381—47 **26 Claims**



1. A method of sound analysis of a sound produced during a limited period of time and which is converted into an electrical sound signal comprising the steps of producing short-term spectrum signals from said signal in consecutive short time intervals, said short-term spectrum signals indicating the energy content of the sound in adjacent spectral ranges, summing all short-term spectra to form a long-term spectra, forming the difference between each short-term spectrum and the preceding short-term spectrum, deriving an intermediate value from all said differences and dividing said intermediate value by the long-term spectrum to form a quotient, and applying the quotient to an arrangement for sound analysis.

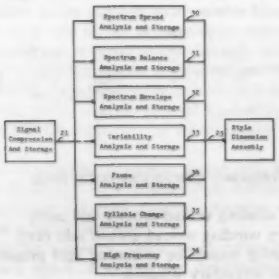
4,490,840
ORAL SOUND ANALYSIS METHOD AND APPARATUS FOR DETERMINING VOICE, SPEECH AND PERCEPTUAL STYLES

Joseph M. Jones, 157 Monahan Dr., Fort Walton Beach, Fla. 32549

Filed Mar. 30, 1982, Ser. No. 363,566

Int. Cl.³ G10L 1/00

U.S. Cl. 381—48 **24 Claims**


Spectrum Spread Analysis and Storage
Spectrum Balance Analysis and Storage
Spectrum Envelope Analysis and Storage
Signal Compression And Storage
Variability Analysis and Storage
Style Dimension Assembly
Pause Analysis and Storage
Syllable Change Analysis and Storage
High Frequency Analysis and Storage

1. A vocal sound analysis method and apparatus for producing a display of vocal sound derived values of a subject, which display can be observed for indications of the subject's vocal/-perceptual profile, the apparatus comprising the combination of:

input means including a microphone and amplifier for receiving vocal sounds and generating representative voltage signals;

segmentation means coupled to said input means to receive said representative voltage signals and segment said signal multiple sweeps each of several consecutive seconds into ⅓ octave regions covering the audio frequency range, and one whole audio band pass region, further comprising digitizer means to digitize said segmented signals;

computer means coupled to said digitizer means containing a permanently stored instruction equation and logic algorithm and memory means to change said digitized signals into frequency and amplitude value representations and to manipulate and store said signals;

said algorithm means further comprising compression means coupled to said memory containing said digital value representations, that reduce the quantity of said values by first discarding all said values but the frequency and amplitude representative values of the amplitude peaks, and then discarding all but six said peak amplitudes' said representative values, and further saving one unfiltered or full band width amplitude representative value from each sweep;

said algorithm means further comprising correction means, coupled to said memory containing said peak's frequency and amplitude values, that further causes each peak's frequency representative value to be adjusted toward the frequency representative value of the adjacent filter having the larger amlplitude, and further, normalizing said frequency representative values by causing all frequency representative values to be multibles of a single small decimal value;

said algorithm means further comprising assembly means connected to the said correction means for assembling the said stored peaks' amplitude and frequency representative values and said full unfiltered signal amplitude representative value into vocal sound style elements, and storing said elements in said memory means;

said algorithm means further comprising coefficient matrix and instruction means coupled to said assembly means that calculates a summation of the products of selected said coefficients and said vocal sound style elements, to produce vocal/perceptual style dimension values that define said vocal/perceptual profile;

display means coupled to the said memory means for displaying all said values on a visually observable medium;

selection means comprising a switch connected to said input means to select a point in time for beginning and terminating said input sampling, said switch including means to connect and disconnect said apparatus to an electrical power source;

said selection means further comprising switch means to select the number of said sweeps per second coupled to the said segmentation means;

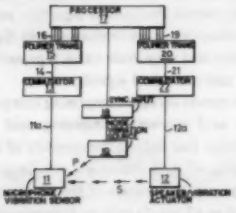
keypad means coupled to said coefficient matrix means for the user to select to override the use of said permanently stored coefficient matrix and to accept a user provided coefficient matrix;

and keypad further comprising selection means connected to the said display means for user selection of said display means.

4,490,841
METHOD AND APPARATUS FOR CANCELLING VIBRATIONS

George B. B. Chaplin, and Roderick A. Smith, both of Colchester, England, assignors to Sound Attenuators Limited, Colchester, England

PCT No. PCT/GB82/00299, § 371 Date Jun. 17, 1983, § 102(e) Date Jun. 17, 1983, PCT Pub. No. WO83/01525, PCT Pub. Date Apr. 28, 1983
PCT Filed Oct. 21, 1982, Ser. No. 518,802
Claims priority, application United Kingdom, Oct. 21, 1981, 8131674
Int. Cl.³ G10K *11/16*
U.S. Cl. 381—71 7 Claims

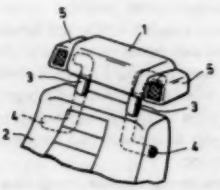


1. A method of cancelling repetitive vibrations comprising sensing the residual vibrations resulting from interference between primary vibrations from a source of repetitive vibrations and secondary vibrations from a driven actuator, transforming the sensed residual vibrations into a plurality of independent pairs of components which together define the residual vibrations at a plurality of different locations in the transformed domain, each synchronised to the repeat period of the repetitive primary vibrations from the source, separately modifying each component of each pair of components, transforming the said independent pairs of components back into a drive signal for the actuator and controlling the separate modification of the components of the pairs of components to reduce the power or amplitude of the residual vibrations.

4,490,842
HEADREST SPEAKER DEVICE

Tatsuya Watanabe, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed May 18, 1982, Ser. No. 379,546
Claims priority, application Japan, May 22, 1981, 56-73264[U]
Int. Cl.³ H04R *1/02, 5/02*
U.S. Cl. 381—86 11 Claims

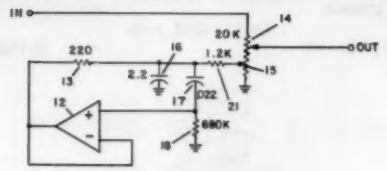


1. In an apparatus which includes a seat having a backrest and two spaced speaker cabinets supported on said backrest at the upper end thereof, the improvement comprising two elongate pipes which are external to said speaker cabinets and which each open at one end to the interior of a respective one of said speaker cabinets, said pipes improving the middle and low frequency response of said speaker cabinets and minimizing vibration thereof.

4,490,843
DYNAMIC EQUALIZING

Amar G. Bose, Wayland, and Richard G. Plourde, Ashland, both of Mass., assignors to Bose Corporation, Framingham, Mass.

Filed Jun. 14, 1982, Ser. No. 388,097
Int. Cl.³ H03G *9/14*
U.S. Cl. 381—102 19 Claims



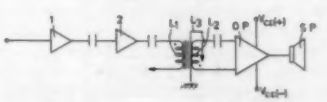
1. In automatic dynamic equalization circuitry having a manually operated variable resistance gain control and means for varying the bass boost in amplitude imparted to spectral components at bass frequencies relative to the amplitude of spectral components at midband frequencies as a function of the manually controlled gain imparted to an audio signal being processed for reproduction as audible sound at midband frequencies, the improvement comprising,

means including said gain control for imparting negligible boost to voice formant spectral components at frequencies in the middle rage of frequencies beginning at 200 Hz for different manually controlled gains imparted to said audio signal as determined by the manual setting of said gain control while significantly changing said bass boost in the bass frequency region therebelow as a function of said gains so that at low listening reproduced sound levels of said audio signal, reproduced bass spectral components are perceived by listeners without degrading reproduced voices when characterized by said audio signal.

4,490,844
LOW FREQUENCY TRANSFORMER

Tong-Hoon Sohn, K.P.O. Box 1512, Seoul, Rep. of Korea

Filed Apr. 11, 1983, Ser. No. 483,506
Claims priority, application Rep. of Korea, Apr. 10, 1982, 82-1582
Int. Cl.³ H01F *27/28*
U.S. Cl. 381—104 11 Claims



1. A low frequency transformer comprising:

a core;

a primary winding wound around said core;

a secondary winding wound around said core;

first insulating means for insulating said primary winding from said secondary winding;

a tertiary winding wound around said core having a first end adapted for connection to ground; and

second insulating means for insulating said secondary winding from said tertiary winding with a second end of said tertiary winding embedded therein.

4,490,845

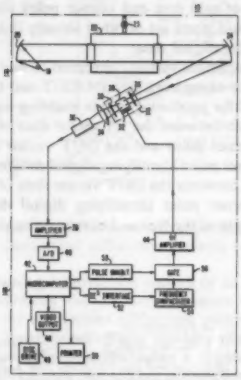
AUTOMATED ACOUSTO-OPTIC INFRARED ANALYZER SYSTEM

Kenneth B. Steinbruegge, Murrysville, and Milton S. Gottlieb, Churchill, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 2, 1982, Ser. No. 345,123

Int. Cl.³ G01J 3/32

U.S. Cl. 382—1 8 Claims



1. A broadband automated acousto-optic tunable filter multigas infrared analyzer system comprising:

(a) means for directing infrared radiation through a sample species to be analyzed, which species have predetermined infrared absorption characteristics;

(b) means for focusing the infrared radiation after modification by the absorptive characteristics of the sample species upon said acoustic-optic tunable filter;

(c) said acoustic-optic tunable filter comprising an input polarizer for selectively polarizing the infrared radiation directed through the sample species, and an optically aligned acoustic-optic crystal through which the selectively polarized infrared radiation is passed at a predetermined angle relative to the crystal optic axis, an acoustic transducer means coupled to a variable frequency rf energy source and to the acousto-optic crystal to launch acoustic waves in the crystal to interact with a selected narrow bandwidth portion of the polarized infrared radiation to make it distinguishable from the remaining infrared radiation, which selected narrow bandwidth portion is a function of the frequency of the rf energy and acoustic waves;

(d) infrared radiation detection means which detects the output filtered infrared radiation from the filter and generates an output electrical signal as a function of the output filtered infrared radiation;

(e) computing means to which the detection means output electrical signal is applied for determining the species present in the sample cell, and including means for the pulsed operation of the rf energy source to determine the timing and frequency of rf energy applied to the acoustic transducer mated to the acousto-optic crystal to determine the infrared wavelength selectivity or tuning of the acousto-optic tunable filter.

4,490,846

PATTERN DISCRIMINATING APPARATUS

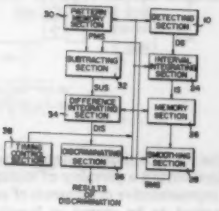
Tsuyoshi Ishida, 16-3, Hirakawa-cho, Kanagawa-Ku; Hideo Osawa, 2006-10, Nakata-cho, Totsuka-ku, both of Yokohama-shi, and Kazuaki Naruse, 4-23-8, Kamirenjaku, Mitaka-shi, Tokyo, all of Japan

Filed Dec. 14, 1981, Ser. No. 330,642

Claims priority, application Japan, Dec. 16, 1980, 55-176493; May 27, 1981, 56-79420; May 27, 1981, 56-79421; May 28, 1981, 56-80067

Int. Cl.³ G06K 9/44

U.S. Cl. 382—7 13 Claims



1. A pattern discriminating apparatus comprising:

detecting means for detecting a pattern of at least one property among properties of an object to be discriminated;

first integrating means for integrating detection signals from said detecting means for each of a plurality of intervals of a readout surface of the object to be discriminated, said plurality of intervals being divided along the direction of movement of the object to be discriminated;

first memory means for storing signals for all of the intervals of the readout surface, each signal output from said first integrating means representing an interval integrated value, and for outputting the signals stored as data signals during readout;

means for smoothing, for each interval, signals from the first memory means, which correspond to that interval and its adjacent intervals, in order to obtain the mean value of the corresponding integrated values thereby reducing the effects of misalignment between the pattern and the detecting means;

second memory means for storing, in advance, an integrated value corresponding to a reference pattern of the property detected by said detecting means for each of the intervals and for outputting the integrated values as reference signals during readout;

operating means for calculating for each of the intervals a comparison value between waveform patterns of the data signals output by said smoothing means and waveforem patterns of the reference signals output by said second memory means;

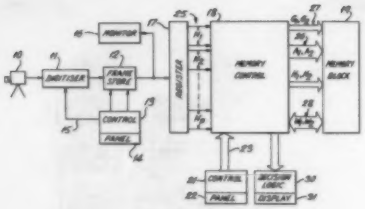
second integrating means for integrating the comparison values of the waveform patterns obtained by said operating means for all of the intervals of the object to be discriminated; and

discriminating means for discriminating, based on the integrated value from said second integrating means, coincidence between the reference pattern and the pattern of the property of the readout surface of the object to be discriminated.

4,490,847
RECOGNITION APPARATUS

Igor Aleksander, London; Thomas J. Stonham, Stoke Talmage, and Bruce A. Wilkie, Pinner, all of England, assignors to National Research Development Corporation, London, England

Filed Nov. 17, 1982, Ser. No. 442,415
Claims priority, application United Kingdom, Nov. 27, 1981, 8135939
Int. Cl.³ G06K 9/00
U.S. Cl. 382—10 10 Claims



1. Apparatus for recognising images, comprising

an input store having a plurality of storage locations allowing data representative of elements of an image which is to be recognised to be stored at locations related to the positions of the elements,

a plurality of output stores each having a number of address terminals which allow every storage location in that store to be addressed, the locations of the output store either containing, or being capable of containing, data related to images which are to be recognised, the address terminals being divided into at least a lower significance group and a higher significance group, each group of terminals containing at least one terminal,

mapping means with input connected to the input store and a plurality of output terminals divided into groups with each group corresponding to a respective output store and at least one of the terminals of that group connected to an address terminal of the lower significance group of the corresponding store,

addressing means connected to the terminals of the higher significance groups for cyclically addressing groups of storage locations, and

discriminator means responsive to output signals from groups of output-store storage locations, when containing data and when addressed by way of the mapping means and by the addressing means during recognition, to provide a measure of recognition.

4,490,848
METHOD AND APPARATUS FOR SORTING CORNER POINTS IN A VISUAL IMAGE PROCESSING SYSTEM

Donald L. Beall, North Syracuse, and Harold W. Tomlinson, Jr., Liverpool, both of N.Y., assignors to General Electric Company, Orlando, Fla.

Filed Mar. 31, 1982, Ser. No. 363,665
Int. Cl.³ G06K 9/48
U.S. Cl. 382—121 20 Claims

1. A feature extractor sorter apparatus for use in a visual image processing system which automatically determines whether newly supplied corner point identifying digital data should be linked to a free end corner point identifying digital data of a given set of other already linked corner point identifying digital data, where each corner point is identified by x, y coordinates and IN and OUT vectors, so as to represent part of a closed edge contour, said apparatus comprising:

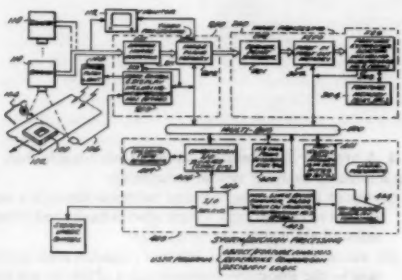
microprocessor means for providing Δx, Δy digital data signals representing the difference Δx, Δy between x, y coordinates of said newly supplied corner point identifying digital data and the x, y coordinates of said free end corner point identifying digital data of a given set of other already linked corner point identifying digital data;

summing means connected to receive said Δx, Δy digital data signals and to compute the sum $\Delta x+\Delta y$ of said Δx, Δy digital data signals and to produce a corresponding $\Delta x+\Delta y$ digital signal;

difference means connected to receive said Δx, Δy digital data signals and to compute the difference $\Delta x-\Delta y$ of said Δx, Δy digital data signals and to produce a corresponding $\Delta x-\Delta y$ digital signal;

memory means for storing vector data representing the IN/OUT vectors of said newly supplied corner point identifying digital data and the unconnected OUT/IN vectors of said free end corner point identifying digital data of said given set of other already linked corner point identifying digital data;

vector comparison means connected to said second register means for comparing said IN/OUT and OUT/IN vector data and for producing a gate enabling signal when there is a match between the IN vector data of the newly supplied corner point and the OUT vector data of the free end corner point identifying digital data and when there is a match between the OUT vector data of the newly supplied corner point identifying digital data and the IN vector data of the free end corner point identifying digital data;



vector orientation detection means connected to receive at least some of said vector data and to produce (a) a vertical vector signal if the IN/OUT (OUT/IN) vector data of either said free end corner point identifying digital data or said newly supplied corner point identifying digital data is vertical, (b) a first diagonal vector signal if the IN/OUT (OUT/IN) vector data of either said free end corner point identifying digital data or said newly supplied corner point identifying digital data is along a first predetermined diagonal, and (c) a second diagonal vector signal if the IN/OUT (OUT/IN) vector data of either said free end corner point identifying digital data or said newly supplied corner point identifying digital data is along a second predetermined diagonal; and

logic gate means connected to receive said $\Delta x+\Delta y$, Δx, $\Delta x-\Delta y$, gate enabling, vertical vector, first diagonal vector and second diagonal vector signals and to produce an identifying control signal output if said gate enabling signal is present and at least any one of the following conditions is also met:

(a) $\Delta x+\Delta y=0$ and said second diagonal vector signal is present,

(b) $\Delta x=0$ and said vertical vector signal is present, or

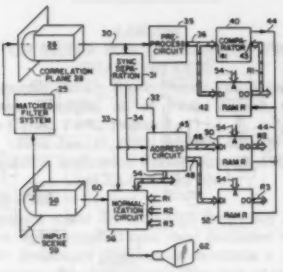
(c) $\Delta x-\Delta y=0$ and said first diagonal vector signal is present.

4,490,849

CORRELATION PLANE RECOGNITION PROCESSOR

Alex Grumet, Whitestone, N.Y., and Martin R. Wohlers, Jr., Hampstead, N.H., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Mar. 4, 1982, Ser. No. 354,722
Int. Cl.[3] G06K 9/00
U.S. Cl. 382—31 27 Claims



1. An optical matched filter system comprising:

a plurality of memorized diffraction patterns of known objects;

means for obtaining a diffraction pattern of an input scene;

means for combining the diffraction pattern of the input scene with the memorized diffraction patterns to obtain correlation imagery including a plurality of non-overlapping correlation maps arranged in a regular geometric array in a correlation plane, each correlation map representing a product of one of the memorized diffraction patterns and the diffraction pattern of the input scene;

means for scanning the correlation plane to produce a video signal in proportion to a light intensity at a scan spot in the correlation plane;

means for detecting pulses in the video signal corresponding to correlation spots in the correlation imagery;

a first comparator circuit having one input connected to the video signal and another input connected to a desired amplitude threshold voltage, such that an output of said first comparator circuit indicates when the amplitude of the video signal exceeds the desired amplitude threshold voltage;

means for deriving a differentiated video signal;

a second comparator circuit having one input connected the differentiated video signal and another input connected to a rising slope threshold voltage proportional to a desired rising slope threshold, such that an output of said second comparator circuit indicates when the amplitude of the video signal is increasing at a rate in excess of the desired rising slope threshold;

a first logic gate having inputs connected to the outputs of the first and second comparator circuits and outputting a threshold start signal indicating the beginning of a video pulse;

a one-shot circuit having an input connected to the threshold start signal and outputting a threshold detection signal in which a threshold pulse indicates the detection of a video pulse having values within the desired ranges of amplitude and rising slope, the duration of the threshold pulse corresponding to a desired bandwidth of the memorized diffraction patterns;

a third comparator circuit having one input connected to the differentiated video signal and another input connected to a falling slope threshold voltage proportional to a desired falling slope threshold such that the third comparator circuit outputs a falling slope threshold signal indicating when the amplitude of the video signal is decreasing faster than the desired falling slope threshold; and

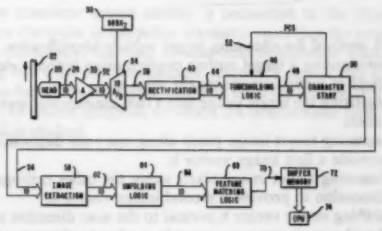
a second logic gate having inputs connected to the threshold detection signal and the falling slope threshold signal and outputting a peak detection signal.

4,490,850

MATRIX CHARACTER RECOGNITION

Robert B. Nally; James F. Akister; Patrick C. Leung, all of Waterloo, and Eric J. Vance, Kitchener, all of Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 17, 1981, Ser. No. 331,935
Int. Cl.[3] G06K 9/68
U.S. Cl. 382—34 11 Claims



1. In a character recognition system wherein a plurality of adjacent rows of first and second binary signals are generated, in which the first binary signals represent a portion of an unknown character and the second binary signals represent a portion of the background of the unknown character, an apparatus for recognizing the unknown character comprising:

first means for storing the rows of binary bits representing the first and second binary signals;

second means for storing binary bits representing third and fourth binary signals in which the third binary signals represent a portion of a known character and the fourth binary signal represents a portion of the background of the known character, said third and fourth binary signals being assigned a numerical value in accordance to the importance of said signals to the configuration of the known character and a second value representing the required presence of certain of said third and fourth binary signals in the configuration of the unknown character and for comparing the binary bits in the location of said first and second binary signals in each row of the unknown character which the binary bits in the corresponding location of the third and fourth binary signals of the known characters, said second storing and comparing means outputting a first signal representing the sum of the numerical values assigned to the third and fourth binary signals equivalent to the first and second binary signals not found in each row between the known and unknown character and a second signal representing the number of said certain of said third and fourth binary signals not equivalent to the first and second binary signals found in each row of said unknown character;

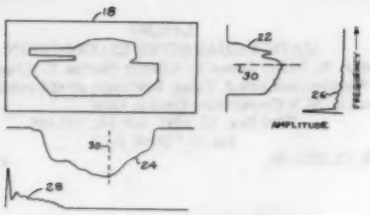
means connected to said comparing means for accumulating said first and second signals for each known character;

and processing means connected to said accumulating means for identifying the unknown character with the known character having the minimum values for the accumulated first and second signals.

4,490,851
TWO-DIMENSIONAL IMAGE DATA REDUCER AND CLASSIFIER

Grant R. Gerhart, and James M. Graziano, both of Oakland, Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 16, 1982, Ser. No. 369,045
Int. Cl.³ G06K 9/36; G06F 15/332
U.S. Cl. 382—43 1 Claim



1. A method for obtaining target vehicle identification values representing a target outline configuration within a detector's field of view, comprising the steps of:

a. digitizing the target image into a two dimensional array of pixels;

b. summing target image pixels along one scan dimension to provide a first image vector b;

c. summing target image pixels along the other orthogonal dimension to provide a second image vector c;

d. shifting image vector b normal to the scan direction such that the maximum component is at a fixed reference point;

e. Fourier transforming the shifted image vector in step d to obtain F;

f. obtaining the real part of F by summing F and its conjugate F* and dividing the resultant vector by 2;

g. obtaining the imaginary part of F by subtracting F* from F and dividing the resultant vector by 2;

h. obtaining a numerical value representing the symmetric part of F in step e by integrating over the square of the real part of F;

i. obtaining a numerical value representing the asymmetric part of F by integrating over the product of the imaginary part of F and the conjugate of the imaginary part of F;

j. obtaining the identification value of image vector b by dividing the numerical value in step h by the sum of the values in steps h and i;

k. repeating steps d through j, using the second image vector c; and

l. in a look-up table predefined in memory, looking up the vehicle corresponding to the identification values obtained by following steps a through k.

4,490,852
IMAGE CAPTURING APPARATUS

Ram N. Sahni, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 17, 1981, Ser. No. 322,336
Int. Cl.³ G06K 9/20, 9/32
U.S. Cl. 382—48 14 Claims

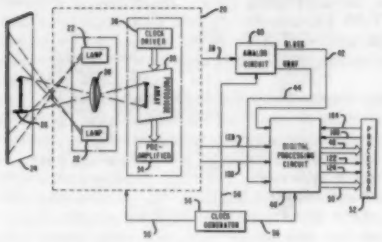
1. A character scanning system for generating data used in recognizing an unknown character comprising;

scanning means for scanning a document including a plurality of scanning members generating voltage signal levels representing a multi-column, multi-row image of the unknown character wherein the voltage level generated by the first and last scanning member in each row represents the background area of the character when the character is centered;

means for detecting white, black and grey signal levels in said voltage signal levels in which the white signal level represents the background data while the black and grey signal levels represent character data;

means responsive to the detection of said white, black and grey signal levels for generating first and second digital signals each representing background area and character data;

first storage means connected to said generating means for serially reading in said first and second digital signals and for outputting said first and second digital signals in parallel;



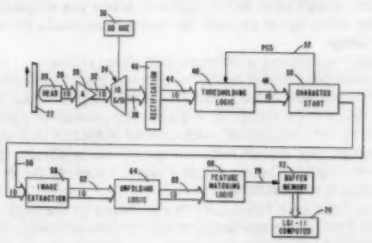
first logic circuit means connected to said first storage means and enabled by the second digital signals to output a first control signal;

and second storage means connected to said first storage means and enabled by said first control signal for storing said first digital signal and a portion of said second digital signal for use by the character recognition system in recognizing the character scanned.

4,490,853
MATRIX CHARACTER READING SYSTEM

Robert B. Nally, Waterloo; Eric J. Vance, Kitchener; Patrick C. Leung, and James F. Akister, both of Waterloo, all of Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 17, 1981, Ser. No. 331,946
Int. Cl.³ G06K 9/20
U.S. Cl. 382—48 17 Claims



1. A method for establishing the location of an unknown character in a character recognition system comprising the steps:

(1) generating a plurality of substantially parallel analog waveforms having varying peak voltage amplitudes and times of occurrence of same representing the configuration of the unknown character;

(2) generating a plurality of first digital values representing the voltage amplitudes in each of the analog waveforms;

(3) applying a first threshold value to said first digital values for generating a plurality of second digital values representing the unknown character and the background of the character;

(4) detecting the start of the unknown character from the second digital values;

(5) generating a second threshold value from said first digital values;
(6) applying said second threshold value to said first digital values for generating third digital values representing the unknown character and fourth digital values representing the background area of the unknown character;
(7) detecting the start of the unknown character from the third and fourth digital values;
(8) and detecting the end of the unknown character from the third and fourth digital values.

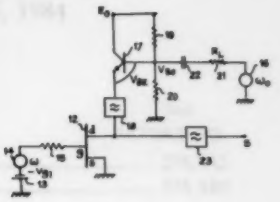
4,490,854

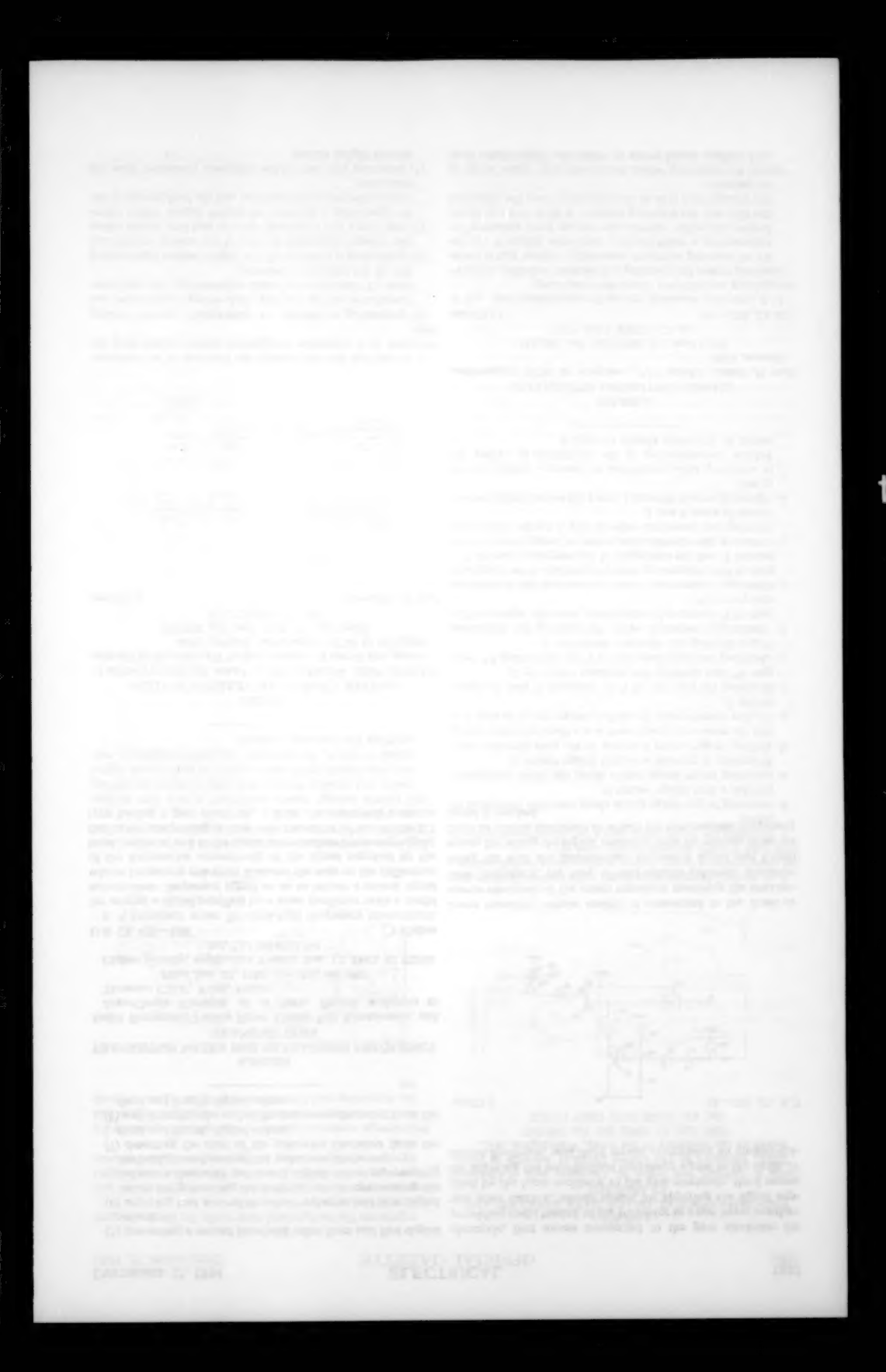
TRANSISTOR MIXER FOR ULTRA-HIGH FREQUENCY TRANSMITTERS

André Bensussan; Patrice Birot; Claude Van Kerrebroeck, and Jean-Claude Curtinot, all of Paris, France, assignors to Thomson C.S.F., Paris, France

Filed Jan. 27, 1983, Ser. No. 461,495
Claims priority, application France, Jan. 12, 1982, 82 02346
Int. Cl.³ H04B 1/04
U.S. Cl. 455—118 **2 Claims**

1. A transistor mixer for ultra-high frequency transmitters, for mixing a signal supplied by a local oscillator with a useful intermediate frequency signal so as to obtain a mixed signal whose frequency spectrum contains the sum or the difference of the frequencies respectively of the signal supplied by the local oscillator and of the useful intermediate frequency signal, the mixer comprising at least one transistor of the MESFET type having a gate electrode, a drain electrode and a source electrode, first means connected to the gate electrode for providing static biasing of the transistor in a non linear conduction zone thereof, second means for applying the signal supplied by the local oscillator to the gate electrode, third means for applying the intermediate frequency signal to the drain or source electrode, said third means comprising an emitter-follower transistor whose emitter is connected to the drain or source electrode of the mixer transistor receiving the intermediate frequency, the base of said emitter-follower transistor being fed with the intermediate frequency signal and fourth means for taking the signal, resulting from the mixing, from the drain or source electrode to which the intermediate frequency signal is applied.





DESIGN PATENTS

GRANTED DEC. 25, 1984

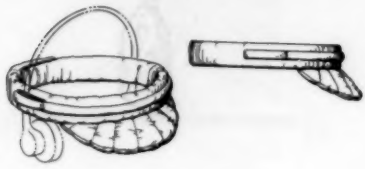
ERRATA

For CLASS	See PATENT NO.
D34–011	276,932
D16–135	276,940

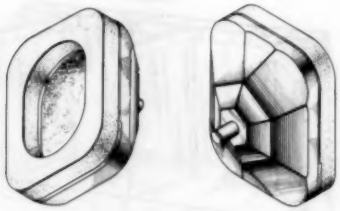
DESIGNS

DECEMBER 25, 1984

276,854
HEADBAND OR THE LIKE
Scott L. Stockton, 6139 Stagecoach Trail, Stillwater, Minn. 55082
Filed Jul. 9, 1982, Ser. No. 396,631
Term of patent 14 years
U.S. Cl. D2—241



276,855
EARMUFF CUP OR SIMILAR ARTICLE
Robert N. Falco, Indianapolis, Ind., assignor to Cabot Corporation, Boston, Mass.
Filed Aug. 4, 1982, Ser. No. 405,017
Term of patent 14 years
U.S. Cl. D2—259



276,856
CROSS-COUNTRY SKI BOOT
Marc Delery, Calvire, and Jean-Paul Vinay, Roybon, both of France, assignors to Salomon S.A., Annecy, France
Filed Apr. 14, 1982, Ser. No. 368,417
Claims priority, application France, Oct. 14, 1981, 814199
Term of patent 14 years
U.S. Cl. D2—276

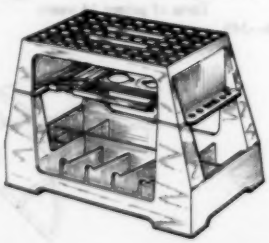
276,857
ROTATABLE COUNTER DISPLAY STAND
Kenneth E. Lindstrom, Colorado Springs, Colo.
Filed Jun. 28, 1982, Ser. No. 393,076
Term of patent 14 years
U.S. Cl. D6—20

276,858
OTTOMAN
Joel A. Kramer, Bradenton, Fla., and Alton A. Harper, Tustin, Calif., assignors to Tropitone Furniture Company, Inc., Sarasota, Fla.
Filed Sep. 29, 1982, Ser. No. 432,113
Term of patent 14 years
U.S. Cl. D6—349

276,859
LOUNGE
Joel A. Kramer, Bradenton, Fla., and Alton A. Harper, Tustin, Calif., assignors to Tropitone Furniture Company, Inc., Sarasota, Fla.
Filed Sep. 29, 1982, Ser. No. 432,114
Term of patent 14 years
U.S. Cl. D6—36

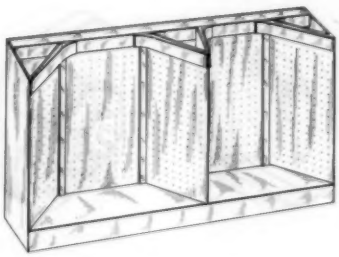
276,860
ARM-CHAIR
Carlo Giorgetti, Meda, Italy, assignor to Giorgetti S.p.A., Meda, Italy
Filed Mar. 16, 1982, Ser. No. 358,783
Claims priority, application Italy, Sep. 17, 1981, 22960/81[U]
Term of patent 14 years
U.S. Cl. D6—57

276,861
COMBINED TOOL CADDY AND STOOL
Burton G. Keddie, Elm Grove, Wis., assignor to Hempe Manufacturing Company, Inc., New Berlin, Wis.
Filed Aug. 27, 1982, Ser. No. 412,351
Term of patent 14 years
U.S. Cl. D6—336

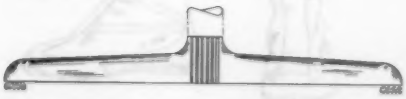


276,862
COMBINED WALL MOUNTED SUPPORT AND SOAP HOLDER
Garthop Upton, 1218 Montego, Arroyo Grande, Calif. 93420
Filed May 3, 1982, Ser. No. 374,641
Term of patent 14 years
U.S. Cl. D6—537

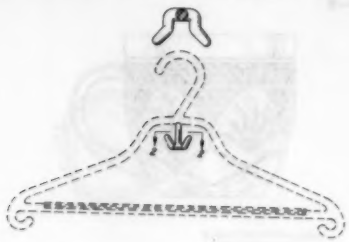
276,863
MERCHANDISE DISPLAY STAND OR SIMILAR ARTICLE
Robert P. Franklin, Lake Hopatcong, N.J., assignor to Trans-World Manufacturing Corporation, East Rutherford, N.J.
Filed Nov. 20, 1981, Ser. No. 323,232
Term of patent 14 years
U.S. Cl. D6—480



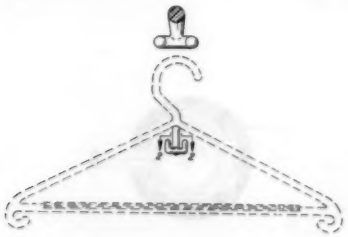
276,864
FURNITURE LEG EXTENSION UNIT OR SIMILAR ARTICLE
Giulio Ponzellini, Bologna, Italy, assignor to Castelli, S.p.A., Bologna, Italy
Filed Jul. 8, 1981, Ser. No. 281,487
Claims priority, application Italy, Jan. 8, 1980, 35508/80[U]
Term of patent 14 years
U.S. Cl. D6—196



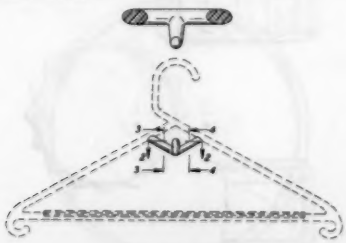
276,865
INTEGRAL HOOK FOR A CLOTHES HANGER
William D. Arnold, St. Louis, Mo., assignor to Lee-Rowan Company, St. Louis, Mo.
Filed Apr. 16, 1982, Ser. No. 368,986
Term of patent 14 years
U.S. Cl. D6—328



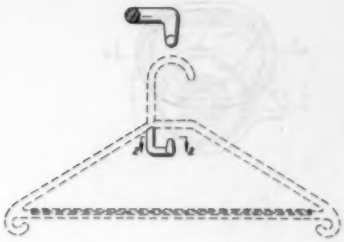
276,866
INTEGRAL HOOK FOR A CLOTHES HANGER
William D. Arnold, St. Louis, Mo., assignor to Lee-Rowan Company, St. Louis, Mo.
Filed Apr. 16, 1982, Ser. No. 368,987
Term of patent 14 years
U.S. Cl. D6—328



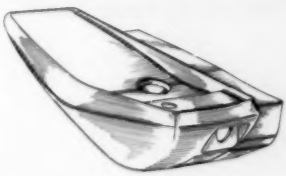
276,867
INTEGRAL HOOK FOR A CLOTHES HANGER
William D. Arnold, St. Louis, Mo., assignor to Lee-Rowan Company, St. Louis, Mo.
Filed Apr. 16, 1982, Ser. No. 368,988
Term of patent 14 years
U.S. Cl. D6—257

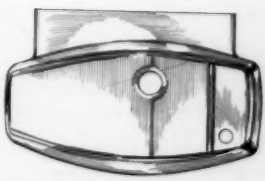


276,868
INTEGRAL HOOK FOR A CLOTHES HANGER
William D. Arnold, St. Louis, Mo., assignor to Lee-Rowan Company, St. Louis, Mo.
Filed Apr. 16, 1982, Ser. No. 368,989
Term of patent 14 years
U.S. Cl. D6—328



276,869
DRINKING FOUNTAIN
Donald W. Doman, Janesville, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jul. 20, 1981, Ser. No. 282,022
Term of patent 14 years
U.S. Cl. D7—304

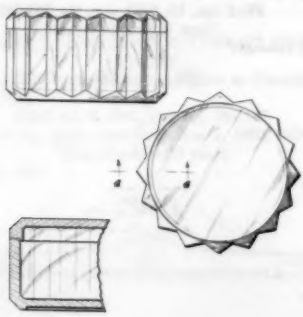




276,870
BAKING DISH OR THE LIKE
Gerald D. Gulotta, New City, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Aug. 16, 1982, Ser. No. 408,068
Term of patent 14 years
U.S. Cl. D7—1

276,871
CUP OR SIMILAR ARTICLE
Philippe J. Durand, Les Danceaux, Chemin de la Garenne, 62510 Arques, France
Filed Sep. 28, 1982, Ser. No. 425,524
Claims priority, application Hague, May 24, 1982, DM/001 481
Term of patent 14 years
U.S. Cl. D7—9

276,872
COMBINED BOWL AND LID
William J. Williams, Shelbyville, Ind., assignor to Williams Industries, Inc., Shelbyville, Ind.
Filed Jul. 30, 1982, Ser. No. 403,420
Term of patent 14 years
U.S. Cl. D7—17



276,873

SNACK TRAY OR THE LIKE

Gerald D. Gulotta, New City, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 16, 1982, Ser. No. 408,155

Term of patent 14 years

U.S. Cl. D7—19

276,874

PLATE OR THE LIKE

Ottorino N. Mercadante, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 26, 1982, Ser. No. 411,609

Term of patent 14 years

U.S. Cl. D7—34

276,875

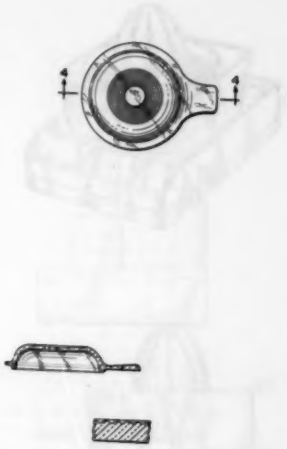
COVER FOR A SERVING DISH OR THE LIKE

Gerald D. Gulotta, New City, N.Y., assignor to Corning Glass Works, Corning, N.Y.

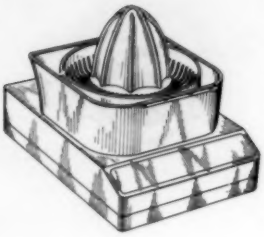
Filed Aug. 16, 1982, Ser. No. 408,156

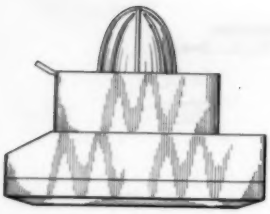
Term of patent 14 years

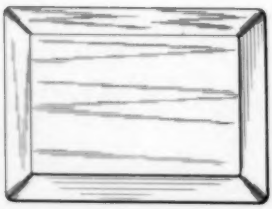
U.S. Cl. D7—40



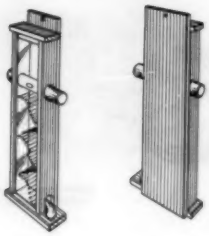
276,876
FRUIT-PRESS
Jan F. Van Asten, Leek, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 1, 1982, Ser. No. 383,654
Claims priority, application Netherlands, Dec. 11, 1981, 56375-02
Term of patent 14 years
U.S. Cl. D7—49







276,877
CANDY DISPENSING MACHINE
James M. Phillips; Neil C. Gugins; Kerry J. Gugins, all of 123 69th Way, Long Beach, Calif. 90805, and David C. Cummings, 1237 Florida St., Long Beach, Calif. 90802
Filed Jul. 2, 1981, Ser. No. 279,685
Term of patent 14 years
U.S. Cl. D7—76

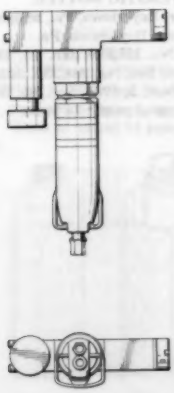


276,878
HAND-HELD BARBECUE SPIT
Donald C. Grigorenko, 727 W. Main St., Plain City, Ohio 43064
Filed Jul. 1, 1982, Ser. No. 394,292
Term of patent 14 years
U.S. Cl. D7—106

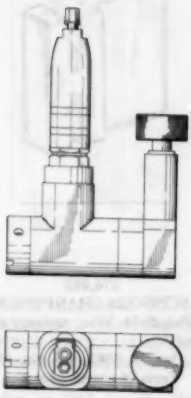
276,879
STUD ADAPTER FOR A DRILL CHUCK
Melvin C. Bell, 10614 Sheldon Woods Way, Elk Grove, Calif. 95624
Filed May 11, 1981, Ser. No. 262,226
Term of patent 14 years
U.S. Cl. D8—70

276,880
SNAP RING PLIERS
Hasegawa Tozaburo, Sanjo, Japan, assignor to Maruto Hasegawa Kosakujo, Inc., Sanjo, Japan
Filed Jul. 1, 1982, Ser. No. 394,072
Claims priority, application Japan, Jan. 12, 1982, 57-702
Term of patent 14 years
U.S. Cl. D8—52

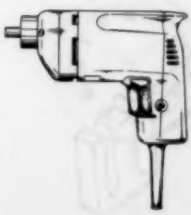
276,881
PORTABLE PIPE END PREPARATION TOOL WITH RIGHT ANGLE FEED CONTROL
William H. Astle, Rancho Cordova, Calif., assignor to Tri Tool, Inc., Rancho Cordova, Calif.
Filed Nov. 22, 1982, Ser. No. 443,663
Term of patent 14 years
U.S. Cl. D8—61



276,882
PORTABLE PIPE END PREPARATION TOOL WITH RIGHT ANGLE FEED CONTROL
William H. Astle, Rancho Cordova, Calif., assignor to Tri Tool, Inc., Rancho Cordova, Calif.
Filed Nov. 22, 1982, Ser. No. 443,665
Term of patent 14 years
U.S. Cl. D8—61

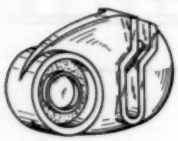


276,883
ELECTRIC HAND DRILL
Detlef Unger, Stuttgart, Fed. Rep. of Germany, assignor to C. & E. Fein GmbH & Co., Fed. Rep. of Germany
Filed Jan. 29, 1982, Ser. No. 344,040
Claims priority, application Fed. Rep. of Ger.many, Nov. 19, 1981, MR 5390
Term of patent 14 years
U.S. Cl. D8—68

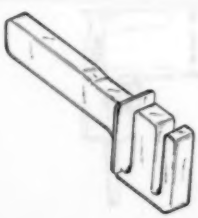


276,884
DUAL KNIFE SHARPENER WITH SINGLE HANDLE
Larry D. Carter, Mosinee, Wis., assignor to Oy Fiskars AB, Helsinki, Finland
Filed Dec. 29, 1982, Ser. No. 454,438
Term of patent 14 years
U.S. Cl. D8—93

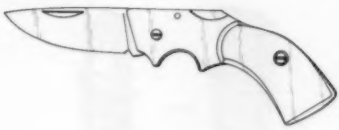
276,885
SCISSORS SHARPENER
Douglas J. Hall, Schofield, Wis., assignor to Oy Fiskars AB, Helsinki, Finland
Filed Dec. 29, 1982, Ser. No. 454,439
Term of patent 14 years
U.S. Cl. D8—93



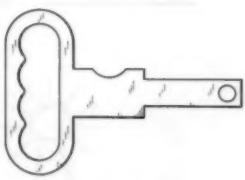
276,886
KNIFE SHARPENER
Larry D. Carter, Mosinee, Wis., assignor to Oy Fiskars AB, Helsinki, Finland
Filed Dec. 29, 1982, Ser. No. 454,442
Term of patent 14 years
U.S. Cl. D8—93



276,887
POCKET KNIFE
Shigeki Sakurai, 41, Midori-machi, Seki-shi, Gifu-ken, Japan
Filed Dec. 30, 1982, Ser. No. 454,729
Term of patent 14 years
U.S. Cl. D8—99



276,888
GUARD LINK FOR USE IN ASSOCIATION WITH A STEERING WHEEL COLUMN LOCK
Hugh D. Jaeger, 3209 W. 76th St., Minneapolis, Minn. 55435
Filed Sep. 7, 1982, Ser. No. 415,587
Term of patent 14 years
U.S. Cl. D8—330

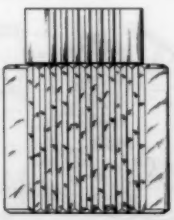


276,889
PLASTIC BOTTLE
Frederick N. Biesecker, Boyertown, Pa., assignor to Drug Plastics & Glass Company, Boyertown, Pa.
Division of Ser. No. 339,814, Jan. 15, 1982, and a continuation-in-part of Ser. No. 282,350, Jul. 9, 1981,. This application Nov. 3, 1983, Ser. No. 548,595
Term of patent 14 years
U.S. Cl. D9—355

276,890
JUG
Jon W. Hancher, Rte. #3, Box 383 A, Brookville, Ind. 47012
Filed May 24, 1982, Ser. No. 381,152
Term of patent 14 years
U.S. Cl. D9—376

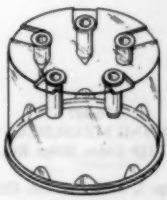
276,891
JAR OR THE LIKE
Vincent E. Fortuna, Huntington Beach, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed Jun. 21, 1982, Ser. No. 390,020
Term of patent 14 years
U.S. Cl. D9—389

276,892
BOTTLE
Alain Carre, 1 rue de la Planche, 75007 Paris, France
Filed Sep. 7, 1982, Ser. No. 415,031
Claims priority, application France, Apr. 15, 1982, 821322
Term of patent 14 years
U.S. Cl. D9—410



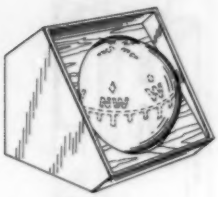
276,893
PACKAGING CONTAINER FOR RAZORS
Richard D. Richards, Liphook, England, assignor to Wilkinson Sword Limited, England
Filed Dec. 2, 1981, Ser. No. 326,955
Claims priority, application United Kingdom, Jul. 3, 1981, 1001311
Term of patent 14 years
U.S. Cl. D9—415

276,894
COMBINED CONTAINER CAP AND HOLDER FOR LIGHTER REFILL ADAPTERS
David G. Whatley, Stoke-on-Trent, England, assignor to Permaflex, Ltd., Stoke-on-Trent, England
Filed Mar. 10, 1982, Ser. No. 356,624
Term of patent 14 years
U.S. Cl. D9—436



276,895
PENDULUM CLOCK
Hiroshi Masuda, No. 1-26, Sugita 5 chome, Isoko-ku, Yokohama City, Kanagawa Prefecture, Japan
Filed Sep. 9, 1982, Ser. No. 416,518
Term of patent 14 years
U.S. Cl. D10—22

276,896
AUTOMOBILE COMPASS
Samuel M. Seltzer, and Saul Dennison, both of Livingston, N.J., assignors to Allison Corporation, Livingston, N.J.
Filed Dec. 1, 1982, Ser. No. 445,764
Term of patent 14 years
U.S. Cl. D10—68



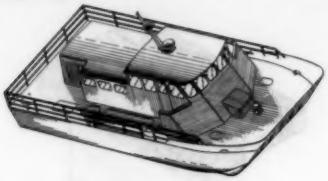
276,897
TELESCOPING MEASURING STICK
Stephanie C. Woods, 2119 Union Ridge Rd., Placerville, Calif. 95667
Filed Sep. 7, 1982, Ser. No. 415,626
Term of patent 14 years
U.S. Cl. D10—70

276,898
PORTABLE GREENHOUSE
John R. Strenger, 5 June Ter., and Steven D. Blanchard, 5 E. Scott St., both of Lake Forest, Ill. 60045
Continuation-in-part of Ser. No. 65,353, Aug. 9, 1979, Pat. No. Des. 263,366. This application Jun. 15, 1981, Ser. No. 273,366
Term of patent 14 years
U.S. Cl. D11—145

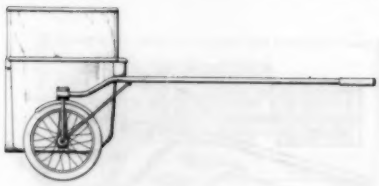
276,899
TABLE ORNAMENT
Frank Deeley, Villa Coolins, Ilsham Marine Dr.; Lawrence Deeley, 45 Broadley Dr., and Kevin P. Burnett, 11a Braddons Hill Rd. West, all of Torquay, Devon, England
Filed Jul. 14, 1982, Ser. No. 398,268
Claims priority, application United Kingdom, Jan. 15, 1982, 1004624
Term of patent 14 years
U.S. Cl. D11—158

276,900
TABLE ORNAMENT
Jean W. Heap, Pwllheli, Wales, assignor to Pendelfin Studios Limited, Burnley, England
Filed Jul. 28, 1982, Ser. No. 402,671
Claims priority, application United Kingdom, Jun. 8, 1982, 1007156
Term of patent 14 years
U.S. Cl. D11—158

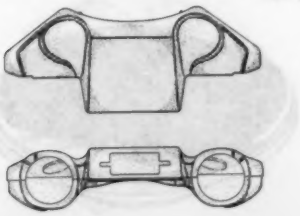
276,901
SURFACE EFFECT SHIP
John B. Chaplin, Covington, La., assignor to Textron Inc., Providence, R.I.
Filed Dec. 2, 1982, Ser. No. 446,324
Term of patent 14 years
U.S. Cl. D12—5



276,902
JOGGING CART FOR HORSE
Jerome R. Plugge, Cordova, Md., assignor to Marcel G. Talbot, Chester, Md.
Filed Sep. 30, 1982, Ser. No. 429,143
Term of patent 14 years
U.S. Cl. D12—19



276,903
MOTORCYCLE RADIO HOUSING
Fred O. Hoese, 30706 Wildcat Dr., Bulverde, Tex. 78163
Filed Aug. 24, 1981, Ser. No. 295,762
The portion of the term of this patent subsequent to Mar. 30, 1996, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—114

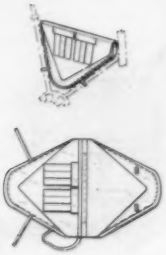


276,904
MOBILE CHAIR FOR THE HANDICAPPED
Melvin E. Shepard, Bridgeport, Mich., assignor to Amigo Sales, Inc., Bridgeport, Mich.
Filed May 3, 1982, Ser. No. 374,231
Term of patent 14 years
U.S. Cl. D12—131

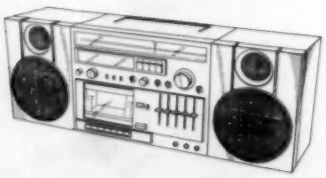
276,905
VEHICLE TIRE
Hideaki Nishio, Saitama; Hiroshi Kojima, Tokyo; Akira Inoue, Tokyo, and Yuji Sakamaki, Tokyo, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Apr. 26, 1982, Ser. No. 372,262
Claims priority, application Japan, Oct. 27, 1981, 56-47511
Term of patent 14 years
U.S. Cl. D12—147

276,906
VEHICLE TIRE
Hiroshi Kojima, Tokyo; Hideaki Nishio, Saitama; Kazuhiro Tanaka, and Toru Tsuda, both of Tokyo, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Aug. 16, 1982, Ser. No. 408,297
Claims priority, application Japan, Feb. 16, 1982, 57-6025
Term of patent 14 years
U.S. Cl. D12—147

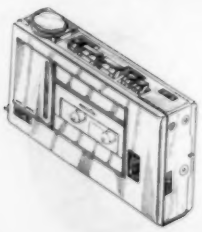
276,907
BICYCLE BAG
Cunningham, Royce, 1702 Crescent Heights, Los Angeles, Calif. 90035
Filed Jun. 9, 1982, Ser. No. 386,769
Term of patent 14 years
U.S. Cl. D12—158



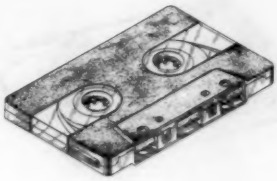
276,908
COMBINED RADIO AND CASSETTE TAPE RECORDER
Katsutoshi Kido, Kyoto; Benito Mishiro, Osaka; Kikuo Ohta, Nara; Kunio Hoshino, Kyoto; Satoru Usami, and Shinzo Murakami, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 23, 1982, Ser. No. 391,338
Claims priority, application Japan, Dec. 23, 1981, 56-58527
Term of patent 14 years
U.S. Cl. D14—5



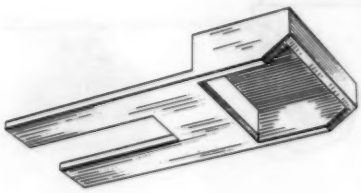
276,909
COMBINED TAPE RECORDER AND RADIO
Manabu Takahashi, Musashino, and Toshihiko Kadota, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Jul. 7, 1982, Ser. No. 396,006
Claims priority, application Japan, Jan. 12, 1982, 57/717
Term of patent 14 years
U.S. Cl. D14—5



276,910
MAGNETIC TAPE CASSETTE OR SIMILAR ARTICLE
Emil Lohrer, Filderstadt; Guenter Hirsch, Koenigsbach-Stein, and Hans J. Wolf, Sternenfels, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany
Filed Sep. 8, 1981, Ser. No. 299,936
Term of patent 14 years
U.S. Cl. D14—11



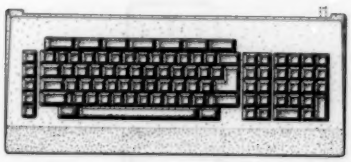
276,911
ADAPTOR TO PERMIT RECORDING ON A CASSETTE
Robert J. Schmidt, 459 Sutherland Dr., Toronto, Ontario, Canada M4G 1K7
Filed May 14, 1982, Ser. No. 378,282
Claims priority, application Canada, Dec. 21, 1981, 21-12-81-2
Term of patent 14 years
U.S. Cl. D14—11



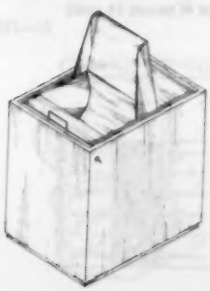
276,912
LOUDSPEAKER
Katsuya Yoshikawa, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed May 17, 1982, Ser. No. 379,191
Claims priority, application Japan, Dec. 17, 1981, 56-55972; Dec. 17, 1981, 56-55973
Term of patent 14 years
U.S. Cl. D14—30

276,913
RADIO RECEIVER
Takao Okada, Kyoto; Benito Mishiro, Osaka, and Kikuo Ohta, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 21, 1982, Ser. No. 390,568
Claims priority, application Japan, Dec. 23, 1981, 56-58522
Term of patent 14 years
U.S. Cl. D14—71

276,914
KEYBOARD CONSOLE
David P. Moriconi, Ben Lomond, Calif., assignor to Victor Technologies, Inc., Scotts Valley, Calif.
Filed Sep. 30, 1982, Ser. No. 429,769
Term of patent 14 years
U.S. Cl. D14—100



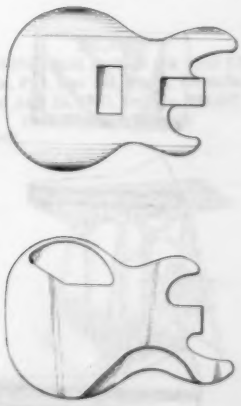
276,915
DEBURRING MACHINE
James R. Wilbourn, 335 Rockcut Rd., Gurley, Ala. 35748
Filed Dec. 16, 1982, Ser. No. 450,358
Term of patent 14 years
U.S. Cl. D15—124



276,916
PROCESS KIT FOR ELECTROPHOTOGRAPHIC APPARATUS
Nobuo Masaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 29, 1982, Ser. No. 403,018
Claims priority, application Japan, Feb. 3, 1982, 57/4375
Term of patent 14 years
U.S. Cl. D16—32

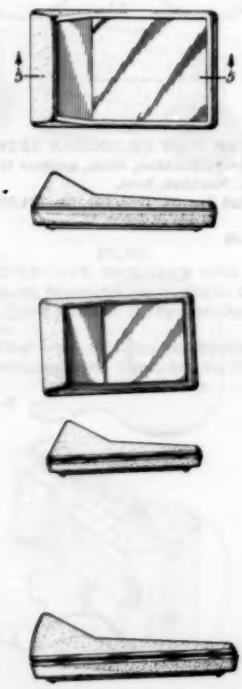
276,917
SUNGLASS
Bernhard Meyerspeer, Gries-Pinzgau, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Mar. 31, 1982, Ser. No. 363,947
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, 11 AR 399/82
Term of patent 14 years
U.S. Cl. D16—102

276,918
GUITAR BODY OR SIMILAR ARTICLE
Hartley D. Peavey, Meridian, Miss., assignor to Peavey Electronics Corp., Meridian, Miss.
Filed Jun. 24, 1982, Ser. No. 391,839
Term of patent 14 years
U.S. Cl. D17—20

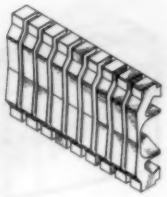


276,919
ELECTRONIC CASH REGISTER
Junichi Sakamoto, and Hiroshi Nishibori, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Mar. 15, 1982, Ser. No. 410,470
Claims priority, application Japan, Sep. 18, 1981, 56/41910
Term of patent 14 years
U.S. Cl. D18—4

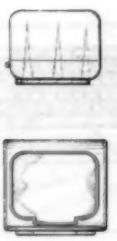
276,920
READILY DISASSEMBLED INSTRUMENT HOUSING
Peter A. Peroni, Pottstown, Pa., assignor to LaFrance Corporation, Philadelphia, Pa.
Continuation-in-part of Ser. No. 24,061, Mar. 26, 1979, Pat. No. Des. 264,347. This application May 10, 1982, Ser. No. 376,621
Term of patent 14 years
U.S. Cl. D18—11



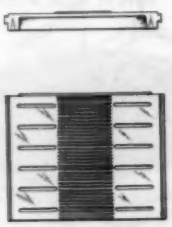
276,921
SLIDABLE RETAINER FOR A FLEXABLE POST BINDER
Loren J. Hulber, Edina, Minn., and William D. Stuertz, Glenview, Ill., assignors to Jostens, Inc., Minneapolis, Minn.
Filed Sep. 29, 1982, Ser. No. 428,425
Term of patent 14 years
U.S. Cl. D19—32



276,922
FILE HOUSING
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed Jun. 14, 1982, Ser. No. 375,364
Term of patent 14 years
U.S. Cl. D19—76



276,923
BASE PLATE FOR USE IN A FILING SYSTEM
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed Aug. 14, 1982, Ser. No. 373,339
Term of patent 14 years
U.S. Cl. D19—99



276,924

BEZEL FOR A COIN OR TOKEN FREED MECHANISM

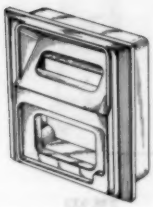
Robert D. Bellis, Delph nr. Oldham, England, assignor to Coin Controls Limited, Oldham, England

Filed Apr. 26, 1982, Ser. No. 371,712

Claims priority, application United Kingdom, Oct. 28, 1981, 1003246

Term of patent 14 years

U.S. Cl. D20—9



276,925

TOY RABBIT RATTLE

Terry Paczko, Cleveland, Ohio, assignor to Questor Corp., Tampa, Fla.

Filed Sep. 30, 1982, Ser. No. 431,660

Term of patent 14 years

U.S. Cl. D21—65

276,926

TOY BUILDING BLOCK

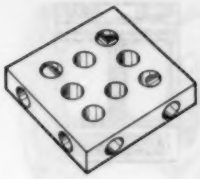
Nils A. I. Petersson, Killeberg, Sweden, assignor to Brio Toy AB, Osby, Sweden

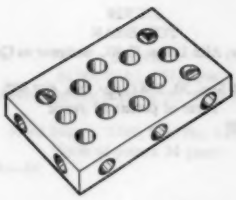
Filed Jul. 16, 1982, Ser. No. 398,938

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1982, URA 69/82

Term of patent 14 years

U.S. Cl. D21—108





276,927

TOY SWING FOR DOLLS OR THE LIKE

Clarence G. Bolin, P.O. Box 368, Rte. 1, Ellabelle, Ga. 31308

Filed Aug. 16, 1982, Ser. No. 408,617

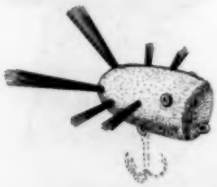
Term of patent 14 years

U.S. Cl. D21—340

276,928
TOY SINK OR SIMILAR ARTICLE
John R. Nottingham, 4875 Stacy Ct., Richmond Heights, Ohio 44143, and John W. Spirk, Jr., 2533 Euclid Heights Blvd., Cleveland Heights, Ohio 44106
Filed Jun. 11, 1982, Ser. No. 387,283
Term of patent 14 years
U.S. Cl. D21—122

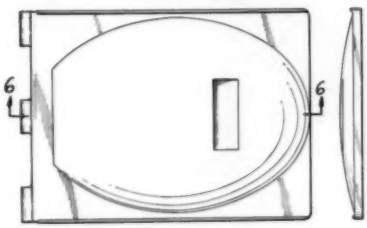
276,929
TOY BEAR
Valerie Daugherty, Alta Loma, Calif., assignor to Questor Corp., Tampa, Fla.
Filed Sep. 30, 1982, Ser. No. 431,828
Term of patent 14 years
U.S. Cl. D21—159

276,930
FISHING LURE
Joseph E. Summers, 3580 North 250 West, West Lafayette, Ind. 47906
Filed Oct. 25, 1982, Ser. No. 436,344
Term of patent 14 years
U.S. Cl. D22—27

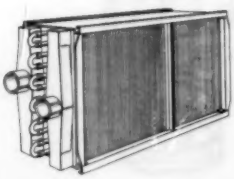


276,931
COMMODE CHAIR
Andrew Bard, 9210 W. Broward Blvd., Plantation, Fla. 33324
Filed Mar. 30, 1982, Ser. No. 363,568
Term of patent 14 years
U.S. Cl. D23—48

276,932
LID FOR A TRASH RECEPTACLE
Bruce H. Parker, Valencia, Calif., assignor to Peabody Solid Wastes Management, Inc., Pacoima, Calif.
Filed Feb. 8, 1982, Ser. No. 346,925
Term of patent 14 years
U.S. Cl. D34—11



276,933
HEAT EXCHANGER
Donald C. Welch, and Christopher P. Yoerg, both of La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.
Filed Apr. 14, 1982, Ser. No. 368,259
Term of patent 14 years
U.S. Cl. D23—136



276,934

COMBINED PUMP AND TELESCOPIC SUPPORT POLE

Anthony P. Smallhorn, Hitchin, England, assignor to Peritronic Medical Industries, plc, London, England

Filed Aug. 16, 1983, Ser. No. 523,805

Claims priority, application United Kingdom, Feb. 21, 1983, 1011539

Term of patent 14 years

U.S. Cl. D24—8

276,935

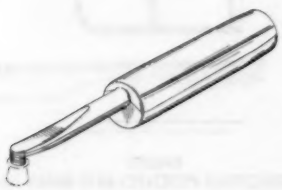
PERSONAL DENTAL CARE APPLIANCE

John B. Fattaleh, 4937 N. 43rd St., Phoenix, Ariz. 85018

Filed May 12, 1982, Ser. No. 377,238

Term of patent 14 years

U.S. Cl. D24—10



276,936

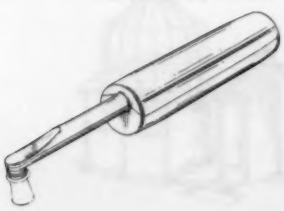
PERSONAL DENTAL CARE APPLIANCE

John B. Fattaleh, 4937 N. 43rd St., Phoenix, Ariz. 85018

Filed May 24, 1982, Ser. No. 381,500

Term of patent 14 years

U.S. Cl. D24—10



276,937

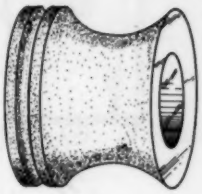
MYRINGOTOMY TUBE

Calvin C. Griggs, Memphis, Tenn., assignor to Treace Medical, Inc., Memphis, Tenn.

Filed Sep. 29, 1982, Ser. No. 428,060

Term of patent 14 years

U.S. Cl. D24—34



276,938

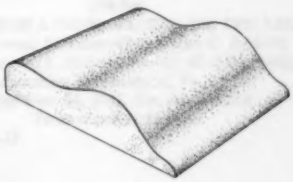
SURGICAL PILLOW

Erling Pedersen, Kornumgardsvej 20, 9700 Brondersiev, Denmark

Filed May 1, 1980, Ser. No. 145,723

Term of patent 14 years

U.S. Cl. D24—36



276,939

BABY PACIFIER WITH CORD

Lawrence E. Pascoe, Rte. 6, Box 174, Pittsburgh, Tex. 75686

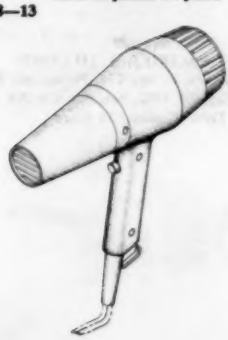
Filed Sep. 28, 1982, Ser. No. 425,495

Term of patent 14 years

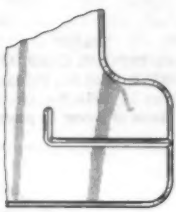
U.S. Cl. D24—46

276,940
MAGNIFIER LAMP
Ralf Andersson, Gothenburg, Sweden, assignor to Malon AB, Surte, Sweden and Ledu Corporation, Trumbull, Conn.
Filed Sep. 29, 1982, Ser. No. 427,832
Term of patent 14 years
U.S. Cl. D16—135

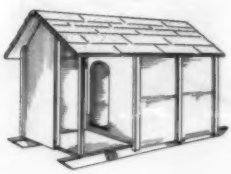
276,941
HAIR DRYER
Benjamin H. Stansbury, Jr., Beverly Hills, Calif., assignor to Redken Laboratories, Inc., Canoga Park, Calif.
Filed Jul. 30, 1982, Ser. No. 403,913
Term of patent 14 years
U.S. Cl. D28—13



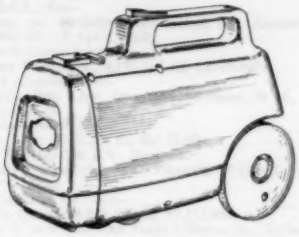
276,942
FLOSS HOLDER
Jeanette S. Crews, 4 Killian Hill Rd., Lilburn, Ga. 30247
Filed Dec. 3, 1981, Ser. No. 327,184
Term of patent 14 years
U.S. Cl. D28—64



276,943
DOGHOUSE OR SIMILAR ARTICLE
Fred Parrett, 2131 N. Bosart Ave., Indianapolis, Ind. 46318
Filed Sep. 29, 1982, Ser. No. 426,991
Term of patent 14 years
U.S. Cl. D30—1



276,944
PORTABLE VACUUM CLEANER
Kenneth R. Parker, Normal, and Samuel E. Hohulin, Lexington, both of Ill., assignors to National Union Electric Corporation, Bloomington, Ill.
Filed Aug. 25, 1982, Ser. No. 411,576
Term of patent 14 years
U.S. Cl. D32—24

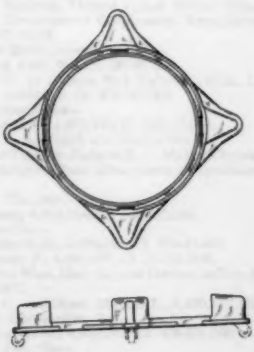


276,945
COMB FOR CARPET SWEEPER BRUSHES
Gordon W. Goodrich, Grand Rapids, Mich., assignor to Bissell Inc., Grand Rapids, Mich.
Filed Jul. 12, 1982, Ser. No. 397,676
Term of patent 14 years
U.S. Cl. D32—49

276,946
DISPOSAL TANK FOR CHICKEN CARCASSES OR THE LIKE
Henry Roper, Star Rte. 1, Box 346, Edgemont, Ark. 72044
Filed Sep. 13, 1982, Ser. No. 417,436
Term of patent 14 years
U.S. Cl. D34—7

276,947
CART FOR CURING CIRCUIT BOARDS
Douglas K. Dennis, Guelph, Canada, assignor to AMF Inc., White Plains, N.Y.
Filed Sep. 22, 1982, Ser. No. 421,650
Term of patent 14 years
U.S. Cl. D34—19

276,948
DOLLY FOR A TANK, BARREL, OR THE LIKE
Rudolph W. Wacek, Montoursville; Robert C. Berfield, Jersey Shore, and Ronald F. Meland, Muncy, all of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.
Filed Nov. 12, 1982, Ser. No. 440,802
Term of patent 14 years
U.S. Cl. D34—23



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF DECEMBER, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Verbanac, Frank, 4,490,516, Cl. 527-312.000.

A.F.G. S.R.L.: *See*—
Adami nee Michelini, Giuseppina; and Zoccatelli, Giuseppe, 4,490,085, Cl. 414-229.000.

A. O. Smith Corporation: *See*—
Nickel, Herbert W., 4,489,846, Cl. 220-69.000.

A/S Niro Atomizer: *See*—
Pisecky, Jan; Krag, Jens; and Sorensen, Ib H., 4,490,403, Cl. 426-453.000.

A.W. Faber-Castell: *See*—
Katz, Otto, 4,490,061, Cl. 401-53.000.

Aarding Weerstandlas B.V.: *See*—
Loggers, Hendrik; and Versteeg, Gijsbert, 4,490,178, Cl. 106-118.000.

Aaxon Industrial, Inc.: *See*—
Davis, Charles, 4,490,162, Cl. 55-213.000.

Ab, Emil A., to Middle East Trade Alliance, Inc. Technique and apparatus for two-phase systems analysis directly in a flow. 4,490,832, Cl. 378-47.000.

Abbott Laboratories: *See*—
Carr, Travis C.; and Finch, Dale E., 4,490,140, Cl. 604-65.000.
Flattner, Jacob J.; and Fung, Anthony K., 4,490,384, Cl. 424-272.000.

Abe, Mitsuo; Nagai, Hisao; and Kamiya, Akira, to Japan Synthetic Rubber Co., Ltd. Process for producing rubber modified thermoplastic resin. 4,490,507, Cl. 525-263.000.

Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG: *See*—
Ruch, Jean; and Katryniok, Detlef, 4,490,443, Cl. 429-27.000.

ACF Industries, Incorporated: *See*—
Pearson, Arthur C., 4,489,814, Cl. 188-33.000.

Acheipohl, Fritz, to Windmoller & Holscher. Transverse severing apparatus for webs. 4,490,207, Cl. 156-494.000.

Acker, Rolf-Dieter, to BASF Aktiengesellschaft. Preparation of sulfonamides. 4,490,306, Cl. 260-465.00E.

Acklin, Leo; and Rosier, Marcel, to Ciba-Geigy AG. Apparatus for the liquid-processing of light-sensitive sheet material. 4,490,030, Cl. 354-322.000.

Acla, Howard L.: *See*—
Ritsko, Joseph E.; and Acla, Howard L., 4,490,340, Cl. 423-65.000.

Acomb, Byron H.; and Gusky, Frank J., to Union Carbide Corporation. Pressure reducing regulator for oxygen service. 4,489,751, Cl. 137-505.360.

Acs, Tibor: *See*—
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Honty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos, 4,490,378, Cl. 424-262.000.

Adair, G. Brison. Mechanic's creeper support and utility tray. 4,489,837, Cl. 211-86.000.

Adami nee Michelini, Giuseppina; and Zoccatelli, Giuseppe, to A.F.G. S.R.L. Vehicle hoisting device particularly for use in garages. 4,490,085, Cl. 414-229.000.

Adams, Frederick J., to Cam Gears Limited. Power assisted steering gear. 4,489,755, Cl. 137-625.220.

Adell, Robert, to U.S. Product Development Company. Edge guard. 4,489,519, Cl. 49-462.000.

Adriano, Castellini: *See*—
D'Andrea, Nicola; D'Andrea, Ermanno; Adriano, Castellini; and Ferdinando, Medea, 4,489,629, Cl. 82-1.200.

Advanced Micro Devices, Inc.: *See*—
Wong, Thomas H., 4,490,670, Cl. 323-313.000.

Aeromatic AG: *See*—
Hammer, Karl, 4,489,504, Cl. 34-10.000.

Agafonova, Irina F.: *See*—
Grebenkin, Mikhail F.; Ivashenko, Alexandr V.; Karamysheva, Ljudmila A.; Blinov, Lev M.; Kovshev, Evgeny I.; Shtykov, Nikolai M.; Titov, Viktor V.; Shoshin, Vadim M.; Agafonova, Irina F.; and Barnik, Mikhail I., 4,490,277, Cl. 252-299.600.

Agency of Industrial Science and Technology: *See*—
Tanaka, Kazunobu; Matsuda, Akihisa; and Yoshida, Toshihiko, 4,490,208, Cl. 156-606.000.
Yuki, Nakaji; and Kitagawa, Hiroshi, 4,490,160, Cl. 55-68.000.

Aho, Yrjo , to Exel Oy. Telescopic tube and method for the manufacture thereof. 4,490,063, Cl. 403-109.000.

Aichinger, Dietmar; and Breuer, Hans-Werner, to Albert Obrist AG. Screw-cap for container. 4,489,845, Cl. 215-329.000.

Aida, Hiroyuki: *See*—
Matsui, Tatsuhiko; Aida, Hiroyuki; and Ohnuki, Tomoyoshi, 4,489,967, Cl. 292-339.000.

Aigo, Seiichiro. Spin drier for silicon wafers and the like. 4,489,501, Cl. 34-8.000.

Aigo, Seiichiro. Spin drier for silicon wafers and the like. 4,489,502, Cl. 34-8.000.

Aici Seiki Kabushiki Kaisha: *See*—
Yamada, Sohei; and Miyata, Ichiro, 4,489,927, Cl. 269-137.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Komorizono, Junichi; and Miwa, Akihiko, 4,489,556, Cl. 60-585.000.
Shimomura, Masuo, 4,489,806, Cl. 180-903.000.

Ajiki, Yoshio: *See*—
Yagi, Shizuo; Fujii, Isao; and Ajiki, Yoshio, 4,489,686, Cl. 123-260.000.

Akashi, Goro; and Ueno, Wataru, to Fuji Photo Film Co., Ltd. Cleaning tape. 4,490,762, Cl. 360-128.000.

Akashi, Shunji: *See*—
Yoshida, Hiroshi; Akashi, Shunji; and Kuse, Kazuki, 4,489,873, Cl. 226-162.000.

Akesson, Yngve R., to Societe d'Assistance Technique pour Produits Nestle S. A. Threshing machine. 4,489,735, Cl. 130-30.00H.

Akister, James F.: *See*—
Nally, Robert B.; Akister, James F.; Leung, Patrick C.; and Vance, Eric J., 4,490,850, Cl. 382-34.000.
Nally, Robert B.; Vance, Eric J.; Leung, Patrick C.; and Akister, James F., 4,490,853, Cl. 382-48.000.

Akiyama, Shigeo: *See*—
Kusanagi, Shigekazu; Akiyama, Shigeo; Nobutani, Tohru; and Kawamura, Hideo, 4,490,715, Cl. 340-634.000.

Aktiebolaget Meteve: *See*—
Ekbladh, Fred V. G.; and Tillander, Hans, 4,490,136, Cl. 604-22.000.

Akzona Incorporated: *See*—
James, Alan D.; and Senior, Roy, 4,490,281, Cl. 252-382.000.
Vitzthum, Gunter H.; and Davis, Michael A., 4,490,431, Cl. 428-220.000.

Albert Obrist AG: *See*—
Aichinger, Dietmar; and Breuer, Hans-Werner, 4,489,845, Cl. 215-329.000.

Alberta Energy Company, Ltd.: *See*—
Stipdonk, Gustaaf, 4,489,828, Cl. 198-847.000.

Albonico, Franco, to Meccanotex S.p.A. Padded shoe brake, particularly for bicycles. 4,489,813, Cl. 188-24.210.

Albrecht, Robert J.; Ignatuk, Daniel; Pinto, Albert A.; and Simelunas, William J., to Nabisco Brands, Inc. Waffle sandwich sawing machine. 4,489,632, Cl. 83-404.200.

Albus, Frank E.: *See*—
Browne, James H.; Ward, Robert H.; and Albus, Frank E., 4,489,503, Cl. 34-10.000.

Alcock, A. John: *See*—
Taylor, Roderick S.; Leopold, Kurt E.; and Alcock, A. John, 4,490,651, Cl. 315-150.000.

Aleksander, Igor; Stonham, Thomas J.; and Wilkie, Bruce A., to National Research Development Corporation. Recognition apparatus. 4,490,847, Cl. 382-10.000.

Allegheny Ludlum Steel Corporation: *See*—
Andersen, Poul, 4,489,901, Cl. 242-67.200.

Allen, Archelaius D., to Dobson Park Industries PLC. Underground support devices. 4,490,076, Cl. 405-289.000.

Allen-Bradley Company: *See*—
Nondahl, Thomas A., 4,490,780, Cl. 363-87.000.
Smith, Enoch P., 4,490,657, Cl. 318-434.000.

Allen, Gary F.; and Pantone, Richard S., to Mobay Chemical Corporation. Liquid diphenylmethane diisocyanate compositions. 4,490,300, Cl. 260-453.05P.

Allen Group Inc., The: *See*—
Scourtes, George, 4,489,824, Cl. 198-633.000.

Allied Corporation: *See*—
Dunning, Frederick G., 4,490,199, Cl. 156-73.400.
Frissora, Anthony P., 4,489,499, Cl. 33-181.00R.
Gupta, Arunava; West, Gary A.; and Donlan, Jeffrey P., 4,490,192, Cl. 148-188.000.
Walling, John C.; and Shand, Michael L., 4,490,822, Cl. 372-41.000.

Alpha Therapeutic Corporation: *See*—
Heidebrant, Charles M., 4,490,361, Cl. 424-101.000.

Alps Electric Co., Ltd.: *See*—
Yanagida, Hiroyuki, 4,490,699, Cl. 333-202.000.

Altmann, Heinz: *See*—
Schubert, Herrmann; Deutscher, Hans-Joachim; Kresse, Horst; Demus, Dietrich; Altmann, Heinz; Korber, Marlies; and Bottger, Ute, 4,490,278, Cl. 252-299.630.

Altulor S.A.: *See*—
Evrard, Paul; Lahille, Michel; and Avenel, Michel, 4,490,497, Cl. 524-349.000.

Aluminium de Grece: *See*—
Casdas, Spyridon, 4,490,233, Cl. 204-290.00R.

Aluminium Pechiney: *See*—
Develay, Roger, 4,490,189, Cl. 148-12.70A.

Alvarez, Robert: *See*—
Jones, Gordon H.; Venuti, Michael C.; Alvarez, Robert; and Bruno, John J., 4,490,371, Cl. 424-248.540.

Amagami, Keizo: *See*—
Hirai, Yukio; Amagami, Keizo; Kobayashi, Takao; and Matsumoto, Shinichi, 4,490,596, Cl. 219-10.49R.

Amax Inc.: *See*—
Beckstead, Leo W.; Hogsett, Robert F.; and Voelker, Dennis E., 4,490,339, Cl. 423-58.000.

Ambrus, Dezso ; Szabolcsi, Tamas; and Hutas, Istvan, to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara R.T. 2,2-Dimethyl-1,2-dihydroquinoline derivatives useful as antioxidants, a process for the preparation thereof and mixtures containing them. 4,490,394, Cl. 426-2.000.

Amchem Products, Inc.: *See*—
McCready, Newton W., 4,490,181, Cl. 134-2.000.

American Cyanamid Company: *See*—
Meriwether, Lewis S., 4,490,354, Cl. 424-65.000.
Spatz, David M.; and Cross, Barrington, 4,490,165, Cl. 71-88.000.

American Home Products Corporation: *See*—
Epstein, Paul; Ballas, John S., Jr.; Mandler, John J., Jr.; and Van Horn, Joseph M., 4,489,726, Cl. 128-630.000.
Schiehser, Guy A.; and Strike, Donald P., 4,490,527, Cl. 544-62.000.

American Microsystems, Inc.: *See*—
Barlow, Allen R.; and Petersen, Corey, 4,490,629, Cl. 307-451.000.

American Standard Inc.: *See*—
Olson, Paul E., 4,489,640, Cl. 91-189.00R.

Ames, Geoffrey C., to Owens-Illinois, Inc. Parrot-beakable freestanding plastic drum assemblage. 4,489,847, Cl. 220-71.000.

Amort, Jurgen; Hanisch, Horst; Klapdor, Ute; Suerken, Hans P.; and van der Maas, Hendrikus, to Dynamit Nobel AG. Method for the modification of starch in the presence of solvents. 4,490,526, Cl. 536-102.000.

AMP Incorporated: *See*—
Asick, John C.; Douty, George H.; Goodman, Joseph R.; Jones, Kermit M., Jr.; Landis, John M.; Snyder, Clair W., Jr.; Woratyla, John A.; and Zell, Dale R., 4,489,998, Cl. 339-17.0LM.
Asick, John C.; and Landis, John M., 4,490,000, Cl. 339-17.0LM.
Bakermans, Johannes C. W.; and Grabbe, Dimitry G., 4,489,871, Cl. 226-52.000.
Lawrence, John T.; and Swartz, John C., 4,490,004, Cl. 339-95.00R.
Over, William R.; Wion, Donald A.; and Heffner, Richard M., 4,489,476, Cl. 29-564.400.
Tomita, Akira; and Tominoi, Kunitada, 4,490,574, Cl. 174-36.000.

Ampex Corporation: *See*—
Kamath, Bantval Y., 4,490,748, Cl. 358-314.000.

Amundson, Arthur G. Practice goaltender. 4,489,940, Cl. 273-1.00B.

Anagnostopoulos, Constantine N., to Eastman Kodak Company. Image sensor and rangefinder device having background subtraction with paired analog shift registers. 4,490,036, Cl. 356-1.000.

Anagnostopoulos, Constantine N.; and Frank, Lee F., to Eastman Kodak Company. Image sensor and rangefinder device having background subtraction with bridge network. 4,490,037, Cl. 356-1.000.

Analogic Corporation: *See*—
Poulo, Louis, 4,490,682, Cl. 330-9.000.

Anchor Continental Inc.: *See*—
Howes, John G. B.; and Selway, Rupert A., 4,490,330, Cl. 422-29.000.

Andersen, Henrik W.: *See*—
Ozaki, George T.; Benumof, Jonathan L.; and Andersen, Henrik W., 4,489,721, Cl. 128-205.240.

Andersen, Poul, to Allegheny Ludlum Steel Corporation. Coil winding apparatus. 4,489,901, Cl. 242-67.200.

Anderson, Jeffrey A., to General Motors Corporation. Temperature regulated dual pressure device. 4,489,883, Cl. 236-92.00C.

Anderson, William B., to Rexnord Inc. Mechanical splicing apparatus and method. 4,489,827, Cl. 198-844.000.

Andreadakis, Nicholas C., to Burroughs Corporation. Gas-filled dot matrix display panel. 4,490,647, Cl. 313-586.000.

Andreev, Leonid M.: *See*—
Shamarokov, Alexandr S.; Kuzmin, Alexei V.; Glebov, Vladimir P.; Moskvichev, Viktor F.; Morozova, Nadezhda A.; Filippov, Gennady A.; Tarankov, Gennady A.; Lukasevich, Boris I.; Andreev, Leonid M.; and Grishakov, Viktor I., 4,489,788, Cl. 122-32.000.

Andrei-Alexandru, Marcel; and Prohaska, Hans, to ITT Industries, Inc. Device for monitoring the inflation pressure in a tire of a vehicle wheel. 4,489,599, Cl. 73-146.500.

Andrew Corporation: *See*—
Weir, Walter F., 4,490,726, Cl. 343-840.000.

Anno, James N.: *See*—
Fawcett, Sherwood L.; and Anno, James N., 4,489,557, Cl. 60-605.000.
Fawcett, Sherwood L.; and Anno, James N., 4,489,558, Cl. 60-605.000.
Fawcett, Sherwood L.; and Anno, James N., 4,489,559, Cl. 60-605.000.
Fawcett, Sherwood L.; and Anno, James N., 4,489,560, Cl. 60-605.000.

Anthony, Myron L., to EPIC Research Corporation. Coal conversion processes. 4,490,213, Cl. 201-17.000.

Antonik, Steven J., to Duke University. Firefly-derived repellent compositions and methods of use. 4,490,360, Cl. 424-95.000.

Anzai, Katsushi: *See*—
Ito, Yoshiyasu; Suematsu, Toshio; Takeda, Yuji; Anzai, Katsushi; and Yoshida, Matsuji, 4,489,688, Cl. 123-339.000.

Aoike, Hitoshi: *See*—
Machida, Toyotaka; and Aoike, Hitoshi, 4,490,752, Cl. 358-342.000.

Aoki, Eiichiro; and Higashi, Iwao, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instruments having supplemental tone generating function. 4,489,636, Cl. 84-1.010.

Aoyama, Takuo: *See*—
Fujii, Setsuro; Aoyama, Takuo; Sakurai, Yojiro; Nakayama, Toyoo; Nunomura, Shigeki; Yaegashi, Takashi; and Okutome, Toshiyuki, 4,490,388, Cl. 424-278.000.

Appleton Electric Co.: *See*—
Bolante, Jay J.; and Penzel, Herbert W., 4,490,576, Cl. 174-65.0SS.

Appleton Papers Inc.: *See*—
Brown, Robert W.; and Bowman, Richard P., 4,490,313, Cl. 264-4.700.

Arao, Kozo: *See*—
Shimizu, Isamu; Arao, Kozo; and Inoue, Eiichi, 4,490,450, Cl. 430-57.000.

Arashi, Masahiro, to Komatsu Seiren Co., Ltd.; and Onomori Iron Works Co., Ltd. Jet dyeing apparatus. 4,489,575, Cl. 68-177.000.

Arcari, Giuliana: *See*—
Doria, Gianfederico; Passarotti, Carlo; and Arcari, Giuliana, 4,490,376, Cl. 424-251.000.

Ariyama, Noriyuki: *See*—
Oguri, Yasuo; Awata, Mitsuru; Saito, Junji; Inoue, Soichi; and Ariyama, Noriyuki, 4,490,320, Cl. 264-82.000.

Arlt, Detmar: *See*—
Formanek, Lothar; Hirsch, Martin; Schnabel, Wolfram; Serbent, Harry; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Arlt, Detmar, 4,490,168, Cl. 75-10.00R.

Armco Inc.: *See*—
Lawson, John E., 4,490,073, Cl. 405-169.000.

Armstrong, A. L. Gravel injection apparatus. 4,490,078, Cl. 406-114.000.

Armstrong World Industries, Inc.: *See*—
Culp, Charles R.; and Mearig, Stephen G., 4,490,217, Cl. 204-11.000.
Ollinger, James C.; and Shaub, Melvin H., 4,489,529, Cl. 52-732.000.

Arnegger, Richard E. Device for longitudinally driving a tool. 4,489,724, Cl. 128-303.00R.

Arnold, Bruce E., to Singer Company, The. Overload protection in a motor control system. 4,490,656, Cl. 318-434.000.

Art Systems, Inc.: *See*—
Franks, James A.; Martin, Richard R.; and Walsh, Richard F., 4,490,798, Cl. 364-550.000.

Arthur G. Russell Company, Incorporated, The: *See*—
Buchas, Gerald L., 4,490,654, Cl. 318-130.000.

ASA S.A.: *See*—
Faure, Jean-Louis; and Venot, Jean, 4,489,540, Cl. 57-5.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Imamura, Kazuyoshi; Yasui, Koichi; and Saito, Akeomi, 4,490,415, Cl. 427-358.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Okudaira, Sadao; and Sato, Shigetada, 4,490,017, Cl. 350-427.000.

Asaida, Takashi, to Sony Corporation. Digital color camera. 4,490,738, Cl. 358-50.000.

ASARCO Incorporated: *See*—
Baldwin, William R., 4,490,223, Cl. 204-106.000.

Ashida, Sakichi: *See*—
Takeuchi, Hiroshi; Jyo mura, Shigeru; Nagatsuma, Kazuyuki; Hikita, Mitsutaka; Ito, Yukio; and Ashida, Sakichi, 4,490,641, Cl. 310-366.000.

Ashland Oil, Inc.: *See*—
Goel, Anil B., 4,490,550, Cl. 549-460.000.

Asick, John C.; Douty, George H.; Goodman, Joseph R.; Jones, Kermit M., Jr.; Landis, John M.; Snyder, Clair W., Jr.; Woratyla, John A.; and Zell, Dale R., to AMP Incorporated. Bussing connector system. 4,489,998, Cl. 339-17.0LM.

Asick, John C.; and Landis, John M., to AMP Incorporated. Multiplane crossover contact. 4,490,000, Cl. 339-17.0LM.

Asmussen, Bodo: *See*—
Dies, Rainer; and Asmussen, Bodo, 4,490,368, Cl. 424-232.000.

AT&T Bell Laboratories: *See*—
Jong, Kenneth, 4,490,689, Cl. 332-31.00T.
Turner, Jonathan S., 4,490,817, Cl. 370-17.000.
Turner, Roland J., 4,490,681, Cl. 329-179.000.

AT&T Information Systems Inc.: *See*—
Munson, Verne E., 4,490,582, Cl. 179-81.00B.

AT&T Technologies, Inc.: *See*—
Carlson, Roy C., Jr.; and March, Edward J., 4,489,508, Cl. 34-78.000.
Fletcher, Ivan M., 4,490,230, Cl. 204-228.000.
MacTribble, Robert, 4,489,488, Cl. 29-881.000.

Atkinson, Stuart L.: *See*—
Poston, Billy R.; and Atkinson, Stuart L., 4,490,831, Cl. 375-94.000.

Atlantic Richfield Company: *See*—
Perkins, Thomas K., 4,489,782, Cl. 166-248.000.

Austel, Volkhard: *See*—
Reiffen, Manfred; Heider, Joachim; Hanel, Norbert; Austel, Volkhard; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Noll, Klaus; Pieper, Helmut; Kruger, Gerd; and Keck, Johannes, 4,490,369, Cl. 424-244.000.

Autissier, Nicole: *See*—
Collange, Edmond; Paris, Michel; and Autissier, Nicole, 4,490,221, Cl. 204-72.000.

Automatik Apparate-Maschinenbau H. Hench GmbH: *See*—
Hench, Hans; Lettner, Horst; and Hunke, Friedrich, 4,489,505, Cl. 34-57.00R.

Automation Industries, Inc.: *See*—
Kutnyak, Thomas A., 4,490,575, Cl. 174-47.000.

Automatique Industrielle S.A.: *See*—
Blatrix, Jean-Pierre, 4,489,926, Cl. 269-93.000.

Autotrol Corporation: *See*—
Seal, J. David, 4,490,249, Cl. 210-89.000.

Avenel, Michel: *See*—
Evrard, Paul; Lahille, Michel; and Avenel, Michel, 4,490,497, Cl. 524-349.000.

Avias, Philippe; and Lepretre, Bernard, to Regie Nationale des Usines Renault. Device for controlling the ignition and fuel injection of an internal combustion engine. 4,489,689, Cl. 123-417.000.

Awata, Mitsuru: *See*—
Ogari, Yasuo; Awata, Mitsuru; Saito, Junji; Inoue, Soichi; and Ariyama, Noriyuki, 4,490,320, Cl. 264-82.000.

Awaya, Akira: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Minami, Tamotsu; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,490,393, Cl. 424-263.000.

Ayers, Ray R.: *See*—
Kipp, Robert M.; and Ayers, Ray R., 4,489,964, Cl. 285-374.000.

Ayers, William M., to Halliburton Company. Mobile, sorbent-pad disposal system. 4,489,665, Cl. 110-250.000.

B. D. Wait Co. Limited: *See*—
Shepherd, Charles G., 4,490,311, Cl. 261-92.000.

B. F. Goodrich Company, The: *See*—
Leeds, Donald H., 4,490,201, Cl. 156-155.000.
Mattson, William F.; and Trapp, Dennis L., 4,490,325, Cl. 264-315.000.
Yu, Simon H.; and Versace, Daniel A., 4,490,560, Cl. 568-614.000.

Baas, Albertus H.: *See*—
Crama, Willem J.; and Baas, Albertus H., 4,490,174, Cl. 75-82.000.

Baba, Yasutoshi: *See*—
Haraguchi, Hiroshi; Narita, Kou; Iwata, Toshiharu; and Baba, Yasutoshi, 4,489,692, Cl. 123-425.000.

Babbitt, Richard W.: *See*—
Stern, Richard A.; and Babbitt, Richard W., 4,490,700, Cl. 333-258.000.

Backx, Leo J. J.: *See*—
Heeres, Jan; and Backx, Leo J. J., 4,490,530, Cl. 544-370.000.

Badertscher, Ernest; and Grobety, Pierre, to Societe d'Assistance Technique pour Produits Nestle S.A. Agglomeration nozzle. 4,489,887, Cl. 239-132.100.

Bailey, John M.; and Lindenfelser, Dale L., to Caterpillar Tractor Co. Piston having fuel diverting barrier means. 4,489,687, Cl. 123-269.000.

Bailly, Jean C.; and Sandis, Stylianos, to BP Chimie Societe Anonyme. Process for the preparation of supports based on magnesium chloride for the preparation of catalysts for the polymerization of alpha-olefins and the supports obtained. 4,490,475, Cl. 502-156.000.

Bajer, Jacques J. Tire casing preparation method. 4,490,197, Cl. 156-64.000.

Baker, Bonnie B.: *See*—
Conly, Douglas J.; Baker, Bonnie B.; Larson, David D.; and Riddle, Stanley T., 4,490,032, Cl. 355-14.00R.

Bakermans, Johannes C. W.; and Grabbe, Dimitry G., to AMP Incorporated. Strip feeding apparatus. 4,489,871, Cl. 226-52.000.

Bakke Industries Limited: *See*—
Molnar, Otto, 4,489,655, Cl. 102-217.000.

Bakker, John A., to Illinois Tool Works Inc. Suspender fastener. 4,489,466, Cl. 24-489.000.

Balco, Inc.: *See*—
Borner, Willy, 4,489,608, Cl. 73-487.000.

Baldwin, William R., to ASARCO Incorporated. Electrode for electrometallurgical processes. 4,490,223, Cl. 204-106.000.

Ball Corporation: *See*—
Ruth, Roy L., 4,490,703, Cl. 335-212.000.
Stockton, Ronald J.; and Munson, Robert E., 4,490,721, Cl. 343-368.000.

Ballas, John S., Jr.: *See*—
Epstein, Paul; Ballas, John S., Jr.; Mandler, John J., Jr.; and Van Horn, Joseph M., 4,489,726, Cl. 128-630.000.

Balz, Jurgen, to Schubert & Salzer. Sliding gate fluid control valve. 4,489,756, Cl. 137-625.330.

Balzer, Eric. Louver solar panel. 4,489,709, Cl. 126-417.000.

Bampton, Clifford C., to Rockwell International Corporation. Method of imparting a fine grain structure to 2000 & 7000 series aluminum alloys. 4,490,188, Cl. 148-12.70A.

Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., to Ortho Pharmaceutical Corporation. 5,6-Dialkoxy-3,4-optionally substituted-2(1H)quinazolinones, composition and method of use. 4,490,374, Cl. 424-251.000.

Banks, Bruce A.: *See*—
Mirtich, Michael J.; Sovey, James S.; and Banks, Bruce A., 4,490,229, Cl. 204-192.00C.

Banks, Robert L.; and Kukes, Simon G., to Phillips Petroleum Company. Olefin disproportionation and catalyst therefor. 4,490,478, Cl. 502-254.000.

Bannon, Robert P., to Shell Oil Company. Process for fractionation reboiling. 4,490,215, Cl. 203-98.000.

Barber, Robert J.: *See*—
Charlebois, Leonard J.; Scott, James R.; and Barber, Robert J., 4,489,830, Cl. 206-316.000.

Barchas, Jack D.; Weber, Eckard; and Evans, Christopher J., to Leland Stanford Junior University Stanford Univ., Board of Trustees of The. Metorphamide—a novel morphine-like peptide. 4,490,363, Cl. 424-177.000.

Barlow, Allen R.; and Petersen, Corey, to American Microsystems, Inc. High voltage circuits in low voltage CMOS process. 4,490,629, Cl. 307-451.000.

Barlow, Richard A.: *See*—
Logan, Eugene T.; and Barlow, Richard A., 4,489,852, Cl. 220-469.000.

Barnes, James E. Chiropractic treatment table. 4,489,714, Cl. 128-74.000.

Barnik, Mikhail I.: *See*—
Grebenkin, Mikhail F.; Ivashenko, Alexandr V.; Karamysheva, Ljudmila A.; Blinov, Lev M.; Kovshev, Evgeny I.; Shtykov, Nikolai M.; Titov, Viktor V.; Shoshin, Vadim M.; Agafonova, Irina F.; and Barnik, Mikhail I., 4,490,277, Cl. 252-299.600.

Baron, Walter J., to Water Services of America, Inc. Heat exchanger with tube cleaning element capturing cage interconnection. 4,489,776, Cl. 165-95.000.

Barr, Roger W., to Tyler Refrigeration Corporation. Adjustable electrical outlet assembly. 4,489,995, Cl. 312-236.000.

Barresi, Anthony J.; Nelson, Leonard; and Pogson, Jack, to RCA Corporation. Fixture for solder tinning chip carriers. 4,489,923, Cl. 269-8.000.

Barth, Gerald D., to Illinois Tool Works Inc. Fastener having an axially and radially undulating flange. 4,490,082, Cl. 411-185.000.

Barton, Derek H. R.; Motherwell, William B.; and Zard, Samir Z., to Roussel Uclaf. Compositions and method. 4,490,296, Cl. 260-397.400.

BASF Aktiengesellschaft: *See*—
Acker, Rolf-Dieter, 4,490,306, Cl. 260-465.00E.
Bosche, Horst G.; Nobe, Heinz; and Pachaly, Heinz, 4,490,214, Cl. 203-6.000.
Bott, Kaspar, 4,490,558, Cl. 568-58.000.
Ellingsfeld, Heinz; and Etzbach, Karl-Heinz, 4,490,541, Cl. 548-370.000.
Fechner, Wolf D.; Kranz, Joachim; and Polster, Rudolf, 4,490,176, Cl. 106-23.000.
Kassat, Harry; Wirth, Friedrich; and Wagner, Joachim, 4,489,775, Cl. 165-67.000.

BASF Wyandotte Corporation: *See*—
Patton, John T., Jr.; Narayan, Thirumurti; and Dumas, Louis H., 4,490,490, Cl. 521-177.000.
Schmolka, Irving R., 4,490,279, Cl. 252-357.000.

Bastian, Thomas W.; and Schertz, Charles W., to General Dynamics, Pomona Division. Quick conversion missile system for widebody aircraft. 4,489,638, Cl. 89-1.815.

Batlas, George X., to Bobrick Washroom Equipment, Inc. Liquid dispenser. 4,489,857, Cl. 222-179.000.

Battelle Development Corporation: *See*—
Fawcett, Sherwood L.; and Anno, James N., 4,489,557, Cl. 60-605.000.
Fawcett, Sherwood L.; and Anno, James N., 4,489,558, Cl. 60-605.000.
Fawcett, Sherwood L.; and Anno, James N., 4,489,559, Cl. 60-605.000.
Fawcett, Sherwood L.; and Anno, James N., 4,489,560, Cl. 60-605.000.

Battersby, William R., to USM Corporation. Battery separators. 4,490,447, Cl. 429-143.000.

Bauer, James E. Gun case. 4,489,833, Cl. 206-522.000.

Baughman, Richard C.; and Bump, David S., to Eastman Kodak Company. Method and apparatus for moving a nozzle between a storage position and a position for applying a fluid. 4,489,856, Cl. 222-148.000.

Baumann, Hans D. Low torque valve disc for lined butterfly valves. 4,489,917, Cl. 251-305.000.

Baumberg, Iosif, to H & B Technologies, Inc. Pulse rate monitor. 4,489,731, Cl. 128-690.000.

Baumgaertner, Armin; and Elsaesser, Kurt, to International Standard Electric Corporation. Multilayer electrophotographic recording material comprises a selenium-tellurium first layer and selenium-arsenic containing second layer. 4,490,451, Cl. 430-57.000.

Baumgartner, Donald W.: *See*—
Konzal, Daryl R.; Johnson, Craig N.; and Baumgartner, Donald W., 4,490,130, Cl. 493-106.000.

Bayer Aktiengesellschaft: *See*—
Halcour, Kurt; Lange, Peter-Michael; and Wagner, Rudolf, 4,490,487, Cl. 521-53.000.
Hentschel, Karl-Heinz; Mussig, Bernhard; Dhein, Rolf; and Kussi, Siegfried, 4,490,266, Cl. 252-49.800.
Kossmehl, Gerhard; and Chatzitheodorou, Georg, 4,490,509, Cl. 525-328.500.
Scholl, Hans-Joachim; and Zenner, Armin, 4,490,551, Cl. 560-025.000.

Beall, Donald L.; and Tomlinson, Harold W., Jr., to General Electric Company. Method and apparatus for sorting corner points in a visual image processing system. 4,490,848, Cl. 382-121.000.

Bear Automotive Service Equipment Company: *See*—
Marino, Joseph A.; Kling, Michael J.; Roth, Sydney J.; and Makhija, Surender K., 4,490,799, Cl. 364-551.000.

Beck, Harold K., to Halliburton Company. Low pressure responsive downhole tool with differential pressure holding means. 4,489,786, Cl. 166-374.000.

Beck, Vernon D., to International Business Machines Corporation. Flat cathode ray tube with keystone compensation. 4,490,652, Cl. 315-366.000.

Becker, Dieter J. Process for purification of waste waters accumulated from pulp production, particularly from chlorine bleaching of pulp. 4,490,257, Cl. 210-610.000.

Becker, James F.; and Mayer, Andrew S. Whistle for children's book. 4,490,123, Cl. 446-204.000.

Becker, Kenneth W.; Friedrichs, Louis G., Jr.; Kropp, Lev; and Straka, Richard B., to Miller Brewing Company. Pasteurization method. 4,490,401, Cl. 426-407.000.

Becker, Wilfried: *See*—
Winkler, Gert; Becker, Wilfried; Zielinski, Erich; and Lipp, Herbert, 4,489,639, Cl. 89-46.000.

Beckestrom, Bo, to Landstingens Inkopscentral, LIC, ekonomisk forening. Protector against incontinence or diaper. 4,490,148, Cl. 604-385.000.

Beckman Instruments, Inc.: *See*—
Buzza, Edmund E., 4,490,234, Cl. 204-409.000.
Meyer, Richard C.; and Kan, Peter, 4,490,665, Cl. 318-696.000.

Beckstead, Leo W.; Hogsett, Robert F.; and Voelker, Dennis E., to Amax Inc. Process for recovering tungsten from MoS_3/WS_3 precipitates. 4,490,339, Cl. 423-58.000.

Becton Dickinson and Company: *See*—
Lacko, Mark A.; Brooks, Malcolm J.; Spranger, Douglas M.; and Mitchell, Peter P., 4,490,141, Cl. 604-180.000.

Bednarz, John J.; and Bloodworth, William T., to Circom, Inc. Plural line telephone controller. 4,490,583, Cl. 179-99.00R.

Beebe, Emmett R.; Dizon, Edmund S.; and Kalvaitis, Arvydas J., to S&C Electric Company. Door or cover latch and latching system utilizing same. 4,489,966, Cl. 292-334.000.

Beebe, James C.; and Cargould, Barry D., to Eagle-Picher Industries, Inc. Tire rolling resistance measurement system. 4,489,598, Cl. 73-146.000.

Beecham Group Limited: *See*—
Hill, Stuart A., 4,490,383, Cl. 424-271.000.

Beecham Group p.l.c.: *See*—
Fleming, Ian D.; Noble, David; Noble, Hazel M.; and Wall, Wilfred F., 4,490,294, Cl. 260-245.300.

Beecham Group p.l.c.: *See*—
Fleming, Ian D.; Noble, David; Noble (formerly Gillett), Hazel M.; and Wall, Wilfred F., 4,490,295, Cl. 260-245.300.

Beeston Company Limited: *See*—
Horvath, Stephen, 4,490,349, Cl. 423-657.000.

Behnke, Walter E.: *See*—
Seamans, Ronald E.; and Behnke, Walter E., 4,490,386, Cl. 424-274.000.

Behr, Norbert; van der Mei, Henk; Sirtl, Wolfgang; Schnegelberger, Harald; and von Ettingshausen, Othmar, to Henkel Kommanditgesellschaft auf Aktien. Process for the preparation of spice extracts. 4,490,398, Cl. 426-312.000.

Behrend, William L., to RCA Corporation. I.F. Delay equalizer for a UHF tv transmitter. 4,490,693, Cl. 333-28.00R.

Beiersdorf Aktiengesellschaft: *See*—
Dies, Rainer; and Asmussen, Bodo, 4,490,368, Cl. 424-232.000.

Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Steffes, Helmut; Bleckmann, Hans-Wilheim; Goosens, Andre F. L.; van Kelst, Willi; and Weise, Lutz, to ITT Industries, Inc. Auxiliary power assisted master cylinder arrangement for a vehicle brake system. 4,489,989, Cl. 303-92.000.

Belcher, Samuel: *See*—
Calvert, James W.; and Belcher, Samuel, 4,490,327, Cl. 264-533.000.

Bellay, Jeffrey D.: *See*—
McDonough, Kevin C.; and Bellay, Jeffrey D., 4,490,783, Cl. 364-200.000.

Bendix Corporation, The: *See*—
Kuntman, Daryal, 4,490,720, Cl. 343-17.1PW.

Benfield, Sherwood G., to Unified Technologies, Inc. Apparatus and method for manufacturing solar collectors. 4,490,204, Cl. 156-290.000.

Bengelink, Ronald L.; and Wickemeyer, Robert H., to Boeing Company, The. Nacelle-pylon configuration for an aircraft and method of using the same. 4,489,905, Cl. 244-130.000.

Benson, Richard D.: *See*—
Kardashian, Vahram S.; and Benson, Richard D., 4,490,457, Cl. 430-311.000.

Bensussan, Andre; Birot, Patrice; Van Kerrebroeck, Claude; and Curtinot, Jean-Claude, to Thomson C.S.F. Transistor mixer for ultra-high frequency transmitters. 4,490,854, Cl. 455-118.000.

Bentley Laboratories, Inc.: *See*—
Gordon, Lucas S.; and Sutherland, Karl M., 4,490,254, Cl. 210-247.000.

Benumof, Jonathan L.: *See*—
Ozaki, George T.; Benumof, Jonathan L.; and Andersen, Henrik W., 4,489,721, Cl. 128-205.240.

Bergl, Friedrich: *See*—
Blaas, Wolfgang; Bergl, Friedrich; and Wetmore, Judson D., 4,489,453, Cl. 5-451.000.

Bergquist, Barton L.; and Chang, James C., to University of Northern Iowa Foundation. Low toxicity radiation sensitizer. 4,490,543, Cl. 549-212.000.

Bernardin, Frederick E., Jr.: *See*—
Dickinson, William D.; Mioduszewski, David; and Bernardin, Frederick E., Jr., 4,489,779, Cl. 166-64.000.

Berneke, Erik S.: *See*—
Nissen, Knud E.; and Berneke, Erik S., 4,489,518, Cl. 49-392.000.

Bernhard, Horst, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for rendering nacreous pigments hydrophobic. 4,490,179, Cl. 106-308.00F.

Beroff, Howard; Thompson, Darrell R.; Mericle, Robert W.; and Travis, William C., Jr., to Ethicon, Inc. Molding process for polydioxanone polymers. 4,490,326, Cl. 264-328.160.

Bertus, Brent J.; and McKay, Dwight L., to Phillips Petroleum Company. Germanium dithiophosphate. 4,490,299, Cl. 260-429.00R.

Besan, Janos; Kovacs, Miklos; Kulcsar, Laszlo; Maier, Ferenc; and Pernyeszi, Jozsef, to Nehezvegyipari Kutato Intezet. Process for the preparation of 1,2,4-triazole. 4,490,539, Cl. 548-262.000.

Betz Laboratories Inc.: *See*—
Niu, Joseph H. Y., 4,490,275, Cl. 252-189.000.

Bickman, Bernard F., to Honeywell Inc. Gimbal system with case mounted drives. 4,490,724, Cl. 343-765.000.

Bigbie, Samuel E.; Cavill, Barry R.; Dodgen, David F.; and Nawy, Albert A., to International Business Machines Corporation. Print head motor control system using analog and digital feedback. 4,490,796, Cl. 364-519.000.

Bilka, Kenneth P.: *See*—
Cherukuri, S. Rao; Bilka, Kenneth P.; Hriscisce, Frank; and Piccolo, Dominic J., 4,490,395, Cl. 426-3.000.

Billing, Lars J. T. Tool for making rivet or expansion nails. 4,489,456, Cl. 10-43.000.

Bindra, Perminder S.; and Light, David N., to International Business Machines Corporation. Method of manufacture employing electrochemically dispersed platinum catalysts deposited on a substrate. 4,490,219, Cl. 204-23.000.

Bio-Medical Innovations, Inc.: *See*—
Colquist, Russell W., 4,489,676, Cl. 119-96.000.

Birot, Patrice: *See*—
Bessussan, Andre; Birot, Patrice; Van Kerrebroeck, Claude; and Curtinot, Jean-Claude, 4,490,854, Cl. 455-118.000.

Bisaot, Thomas C.; and Grigsby, William E., to Du Pont de Nemours, E. I., and Company. Membrane assembly, electrochemical cell, and electrolysis process using perfluorinated sandwich type membrane. 4,490,484, Cl. 521-27.000.

Bitter, Lowell E., to Donnelly Mirrors, Inc. Process for making a curved, conductively coated glass member and the product thereof. 4,490,227, Cl. 204-192.0SP.

Biuro Projektow i Realizacji Inwestycji Przemyslu Syntezy Chemicznej "Prosynchem" : *See*—
Plaskura, Andrzej; Lachman, Ignacy; Byrka, Tadeusz; Leszczynski, Zbigniew; Rogalski, Krzysztof; Koch, Marta; and Zyczynski, Jozef, 4,490,310, Cl. 261-79.00A.

Blaas, Wolfgang; Bergl, Friedrich; and Wetmore, Judson D., to Hold-A-Fold, Inc. Seamless, self-supporting waterbed liner unit and method of manufacture. 4,489,453, Cl. 5-451.000.

Black & Decker Inc.: *See*—
Chaconas, Peter C.; and Cowman, George W., 4,489,902, Cl. 242-100.100.
Heck, Edward A., 4,489,525, Cl. 51-170.00R.
Huber, Siefried; and Merkator, Manfred, 4,490,771, Cl. 361-154.000.

Blackwood, Robert L.; and Shapiro, David M. Hyperextension limiting elbow brace. 4,489,716, Cl. 128-77.000.

Blair, Timothy T.: *See*—
Gage, Charles A.; Blair, Timothy T.; and Morgan, Thomas W., 4,490,033, Cl. 355-16.000.

Blanchette, Henry J., to Plastican, Inc. Pivot assembly. 4,489,849, Cl. 220-91.000.

Blaszczak, Larry C.: *See*—
Cooper, Robin D. G.; Blaszczak, Larry C.; and Turner, Jan R., 4,490,370, Cl. 424-246.000.

Blatrix, Jean-Pierre, to Automatique Industrielle S.A. Workpiece supporting and clamping universal device. 4,489,926, Cl. 269-93.000.

Blechschmidt, Wolf J. Modular clamping system. 4,489,929, Cl. 269-282.000.

Bleckmann, Hans-Wilheim: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Steffes, Helmut; Bleckmann, Hans-Wilheim; Goosens, Andre F. L.; van Kelst, Willi; and Weise, Lutz, 4,489,989, Cl. 303-92.000.

Blickstein, Martin J. Voltage and mechanically variable trimmer capacitor. 4,490,772, Cl. 361-281.000.

Blinov, Lev M.: *See*—
Grebenkin, Mikhail F.; Ivashenko, Alexandr V.; Karamysheva, Ljudmila A.; Blinov, Lev M.; Kovshev, Evgeny I.; Shtykov, Nikolai M.; Titov, Viktor V.; Shoshin, Vadim M.; Agafonova, Irina F.; and Barnik, Mikhail I., 4,490,277, Cl. 252-299.600.

Bloodworth, William T.: *See*—
Bednarz, John J.; and Bloodworth, William T., 4,490,583, Cl. 179-99.00R.

Blue Circle Projects (Proprietary) Limited: *See*—
Moore, Richard P., 4,490,260, Cl. 210-738.000.

Blum, Arnold; and Schettler, Helmut, to International Business Machines Corporation. Testing an integrated circuit containing a tristate driver and a control signal generating network therefor. 4,490,673, Cl. 324-158.00R.

Bobo, Jimmy R.: *See*—
Mitchell, Larry L., 4,490,198, Cl. 156-71.000.

Bobrick Washroom Equipment, Inc.: *See*—
Batlas, George X., 4,489,857, Cl. 222-179.000.

Bobrove, Arthur M., to Bobrove, Arthur M. Magnetic lock container cap. 4,489,842, Cl. 215-213.000.

Bochkarev, Gely R.: *See*—
Filippov, Jury M.; and Bochkarev, Gely R., 4,490,248, Cl. 209-164.000.

Bodin, Claude; and Gouin, Alain, to Equipements Automobiles Marchal. Method of manufacturing a reflecting surface. 4,490,228, Cl. 204-192.00R.

Boehringer Ingelheim K.G.: *See*—
Zierenberg, Bernd, 4,490,322, Cl. 264-205.000.

Boeing Company, The: *See*—
Bengelink, Ronald L.; and Wickemeyer, Robert H., 4,489,905, Cl. 244-130.000.
Myrick, Charles C., 4,489,591, Cl. 73-1.00E.
Webster, Frank R., 4,489,523, Cl. 51-165.720.

Boenig, Heinrich J., to United States of America, Energy. Solid-state circuit breaker with current limiting characteristic using a superconducting coil. 4,490,769, Cl. 361-58.000.

Boetger, Ronald L., to Code Manufacturing, Inc. Instant tire inflator. 4,489,855, Cl. 222-5.000.

Bogan, Leonard E.; Knapke, Paul H.; and Miller, Robert L., to International Telephone and Telegraph Corporation. Rate converter. 4,490,819, Cl. 370-84.000.

Bogorsky, Mikhail V.: *See*—
Kuchuk-Yatsenko, Sergei I.; Krivenko, Valery G.; Bogorsky, Mikhail V.; Lazebny, Ivan L.; Porkhun, Fedor K.; Sakharnov, Vasily A.; and Cherednichok, Vitaly T., 4,490,081, Cl. 409-300.000.

Boitiaux, Jean-Paul; and Cosyns, Jean, to Ste Francaise des Produits pour Catalyse chez Institut Francais du Petrole. Supported palladium-gold catalyst, and its manufacture. 4,490,481, Cl. 502-330.000.

Bolante, Jay J.; and Penzel, Herbert W., to Appleton Electric Co. Connector for use with jacketed metal clad cable. 4,490,576, Cl. 174-65.0SS.

Bolhofer, William A.; and Hoffman, Jacob M., to Merck & Co., Inc. Aminoalkyl pyridine derivatives. 4,490,533, Cl. 546-332.000.

Boling, Terry L., to Southern Elastic Corporation. Yarn package and apparatus for winding covered yarn. 4,489,541, Cl. 57-16.000.

Bolt, Reginald C., to Molins PLC. Ejection of faulty cigarettes. 4,489,736, Cl. 131-282.000.

Bolton, David R.; Koverman, Charles A.; and Neargarder, Marvin L., to Perfecto Industries, Inc. Apparatus for producing a loop within a metal strip. 4,489,872, Cl. 226-117.000.

Boren, Roy. Control method and apparatus for fluid delivery in a rotary drill string. 4,489,793, Cl. 175-71.000.

Borg-Warner Chemicals, Inc.: *See*—
Lantz, John M., 4,490,104, Cl. 425-197.000.

Borg-Warner Corporation: *See*—
McIntosh, Arthur M., 4,489,621, Cl. 74-355.000.
Spokas, Romas B.; and Sturges, Fred D., 4,489,680, Cl. 123-41.050.
Underwood, Herbert N., 4,489,622, Cl. 74-361.000.

Borner, Willy, to Balco, Inc. Cycle wheel mounting fixture. 4,489,608, Cl. 73-487.000.

Borom, Marcus P.: *See*—
Lee, Minyoung; Borom, Marcus P.; and Szala, Lawrence E., 4,490,319, Cl. 264-65.000.

Borras, Jaime A.; Suarez, Jose I.; and Victor, Alan M., to Motorola, Inc. Digital and analog phase detector for a frequency synthesizer. 4,490,688, Cl. 331-1.00A.

Bosche, Horst G.; Nohe, Heinz; and Pachaly, Heinz, to BASF Aktiengesellschaft. Process for the preparation of storage-stable alkylene glycol monoalkyl ethers. 4,490,214, Cl. 203-6.000.

Bose, Ajit, to Leco, Inc. Method for slitting and/or sealing plastic film material. 4,490,203, Cl. 156-251.000.

Bose, Amar G.; and Plourde, Richard G., to Bose Corporation. Dynamic equalizing. 4,490,843, Cl. 381-102.000.

Bose Corporation: *See*—
Bose, Amar G.; and Plourde, Richard G., 4,490,843, Cl. 381-102.000.

Bosley, Marvin F.: *See*—
Upchurch, Otha D.; and Bosley, Marvin F., 4,490,070, Cl. 404-121.000.

Bott, Kaspar, to BASF Aktiengesellschaft. Preparation of thioethers. 4,490,558, Cl. 568-58.000.

Bottger, Ute: *See*—
Schubert, Herrmann; Deutscher, Hans-Joachim; Kresse, Horst; Demus, Dietrich; Altmann, Heinz; Korber, Marlies; and Bottger, Ute, 4,490,278, Cl. 252-299.630.

Botwin, Leo; and Kosowsky, Lester H., to United Technologies Corporation. Polarization controlled map matcher missile guidance system. 4,490,719, Cl. 343-5.0MM.

Boulos, Robert: *See*—
Simons, Elliot; and Boulos, Robert, 4,489,723, Cl. 128-207.160.

Boulton, Thomas W., to Imperial Chemical Industries PLC. Electrolytic cell of the filter press type. 4,490,231, Cl. 204-263.000.

Boussois S.A.: *See*—
Tombal, Gerard; and Pagnucco, Gilbert, 4,489,835, Cl. 211-41.000.

Bowden, William L.: *See*—
Moses, Peter R.; and Bowden, William L., 4,490,449, Cl. 429-196.000.

Bowen, David R.: *See*—
Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; Vock, Manfred H.; and Wiegers, Wilhelmus J., 4,490,404, Cl. 426-536.000.
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,490,544, Cl. 549-228.000.

Bowman, Richard P.: *See*—
Brown, Robert W.; and Bowman, Richard P., 4,490,313, Cl. 264-4.700.

Box, Frederick J., to Hands-England Drilling Limited. Pump system for liquid/solid materials with balanced output. 4,490,096, Cl. 417-342.000.

Boyadjieff, George I., to Varco International, Inc. Link tilting mechanism for well rigs. 4,489,794, Cl. 175-85.000.

BP Chimie Societe Anonyme: *See*—
Bailly, Jean C.; and Sandis, Stylianos, 4,490,475, Cl. 502-156.000.

Brak, Stephen B.; and Milek, Henry F., to United States of America, Energy. Bag-out material handling system. 4,489,538, Cl. 53-576.000.

Brame, Durward B. Infrared hydrocarbon remote sensor. 4,490,613, Cl. 250-341.000.

Bramer, Walter C.: *See*—
Worst, Joel G.; Grutter, William G.; and Bramer, Walter C., 4,489,874, Cl. 227-7.000.

Brandenstein, Manfred; Ernst, Horst M.; Walter, Lothar; and Kaschube, Karl-Friedrich, to SKF Kugellagerfabriken GmbH. Self-aligning bearing. 4,489,992, Cl. 384-496.000.

Branum, Gary D.: *See*—
Forward, Cleve H.; Butler, James R.; Watson, James M.; and Branum, Gary D., 4,490,570, Cl. 585-467.000.

Bratanov, Anton A.: *See*—
Marev, Kiril S.; Krachanov, Hristo G.; Bratanov, Anton A.; and Kirchev, Nikolay A., 4,490,335, Cl. 422-269.000.

Braude, Elton. Beverage container cover. 4,489,848, Cl. 220-90.600.

Brauer, Larry F.: *See*—
Hennings, George N.; Nickles, Richmond H.; Brauer, Larry F.; and DeHarrold, Raymond H., 4,489,656, Cl. 102-254.000.

Breckland Meters Limited: *See*—
Ward, Robert W. F., 4,489,615, Cl. 73-861.780.

Brede, Herrmann: *See*—
Flaig, Hans; Rapp, Egon; Brede, Herrmann; and Ganter, Wolfgang, 4,490,051, Cl. 368-109.000.

Brems, John H. Slave rotate mechanism for mechanical hands of gantry type transfer system. 4,490,091, Cl. 414-749.000.

Brennan, Edward J., to PTC Aerospace Inc. Support structure for maximizing or equalizing luggage space under vehicle seats. 4,489,978, Cl. 297-232.000.

Brent, Albert: *See*—
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,490,156, Cl. 48-61.000.

Breskin, Charles A., to Charles A. Breskin Assoc. Inc. Crew-type all plastic closure. 4,489,844, Cl. 215-329.000.

Breuer, Hans-Werner: *See*—
Aichinger, Dietmar; and Breuer, Hans-Werner, 4,489,845, Cl. 215-329.000.

Brigante, Miguel F. Electrostatic scale control apparatus for feed water having rotating helix responsive to water flow rate. 4,490,252, Cl. 210-222.000.

Briggs, Stephen A., to Lucas Industries Limited. Temperature compensation of a resistance bridge circuit. 4,490,803, Cl. 364-571.000.

British Aerospace Public Limited Company: *See*—
Fellas, Christakis N., 4,489,906, Cl. 244-158.00A.

British Steel Corporation: *See*—
Palmer, Nicholas J.; and Pocock, Anthony R. H., 4,489,585, Cl. 72-387.000.

Brittain, David R.; and Wood, Robin, to Imperial Chemical Industries PLC. Spiro[imidazolidine-4,3'-indoline]2,2',5-triones. 4,490,381, Cl. 424-273.00R.

Brode, David A., to Crompton and Knowles Corporation. Disazo sulfophenylpyrazolonestilbene dyes and direct dyes to color cellulose black. 4,490,151, Cl. 8-639.000.

Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., to Celanese Corporation. Self-crimping yarn. 4,489,543, Cl. 57-208.000.

Brooks, Malcolm J.: *See*—
Lacko, Mark A.; Brooks, Malcolm J.; Spranger, Douglas M.; and Mitchell, Peter P., 4,490,141, Cl. 604-180.000.

Brosnan, Stephen J.: *See*—
Komine, Hiroshi; and Brosnan, Stephen J., 4,490,823, Cl. 372-95.000.

Brost, Dale F.: *See*—
Davis, Lorne A., Jr.; Brost, Dale F.; and Haskin, Helen K., 4,490,676, Cl. 324-376.000.

Brouwer, John J.: *See*—
Kirsinas, Peter; Brouwer, John J.; Purpura, Richard M.; and Wiencek, Donald C., 4,489,589, Cl. 72-424.000.

Brown, Brandt G., to Griese, Robert R. Machine tool attachment. 4,489,520, Cl. 51-5.00D.

Brown, David A.: *See*—
Harrison, Joel N.; Daniels, Donald V.; and Brown, David A., 4,490,635, Cl. 310-38.000.

Brown, Ernest C.; Buske, Walter E.; and Putnam, Norman A., to Wolverine Corporation. Material treatment. 4,489,506, Cl. 34-57.00A.

Brown, Lynnie B.; Ford, Charles J., III; and Dugan, Richard F., to Kollmorgen Technologies Corporation. Control system for synchro-

nous brushless motors utilizing torque angle control. 4,490,661, Cl. 318-661.000.

Brown, Paul R.; and Fresch, Henry D., to Goodyear Tire & Rubber Company, The. Assembling method of rolling lobe airspring. 4,489,474, Cl. 29-508.000.

Brown, Richard E.: *See*—
Loev, Bernard; Brown, Richard E.; Huang, Fu-chih; and Jones, Howard, 4,490,373, Cl. 424-250.000.

Brown, Robert W.; and Bowman, Richard P., to Appleton Papers Inc. Capsule manufacture. 4,490,313, Cl. 264-4.700.

Brown, Robert W.: *See*—
Fuzesi, Stephen; and Brown, Robert W., 4,490,517, Cl. 527-401.000.
Fuzesi, Stephen; and Brown, Robert W., 4,490,518, Cl. 527-401.000.

Browne, James H.; Ward, Robert H.; and Albus, Frank E., to Olin Corporation. Process for drying wet particles of available halogen compounds. 4,489,503, Cl. 34-10.000.

Bruckler, Joseph M.; Gordon, James A., III; and Scalise, Stanley J., to United Technologies Corporation. Wave front sensor. 4,490,039, Cl. 356-121.000.

Bruker Analytische Messtechnik GmbH: *See*—
Kauettel, Bertold; and Laukien, Gunther, 4,490,675, Cl. 324-319.000.

Brundage, Richard: *See*—
Terpstra, Daniel A.; and Brundage, Richard, 4,489,909, Cl. 248-99.000.

Bruneau, Jern: *See*—
Lazarre, Flavien; and Bruneau, Jean, 4,490,106, Cl. 431-90.000.

Brunhouse, Robert F., to PanAb. Labeled antibodies and methods. 4,490,473, Cl. 436-518.000.

Brusi, Maurice; and Duboz, George, to L'Air Liquide-Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Ternary fuel having fairly constant acetylene content in the liquid and vapor phase. 4,490,152, Cl. 44-50.000.

Brunke, Ernst-Joachim; and Klein, Erich, to Dragoco Gerberding & Co. GmbH. 1,1-Di(C_1-C_6-alkyl)-2-phenyl-ethane derivatives as perfuming ingredients. 4,490,284, Cl. 252-522.00R.

Bruno, John J.: *See*—
Jones, Gordon H.; Venuti, Michael C.; Alvarez, Robert; and Bruno, John J., 4,490,371, Cl. 424-248.540.

Brunswick Corporation: *See*—
Hundertmark, James M., 4,490,120, Cl. 440-61.000.

Bruzee, Michelle M.: *See*—
Hoffend, Thomas R.; and Bruzee, Michelle M., 4,490,455, Cl. 430-110.000.

Bryan, James S., to Dayco Corporation. Rail fastening system. 4,489,885, Cl. 238-349.000.

Buan, Danilo P.: *See*—
De Luca, Albert M.; and Buan, Danilo P., 4,489,651, Cl. 101-93.360.

Buchas, Gerald L., to Arthur G. Russell Company, Incorporated, The. Control circuit for vibratory devices. 4,490,654, Cl. 318-130.000.

Bucher-Guyer AG: *See*—
Vogt, Willy, 4,490,103, Cl. 425-193.000.

Buchwald, Gregory J., to Motorola, Inc. AM Stereo to FM stereo converter. 4,490,837, Cl. 381-15.000.

Bump, David S.: *See*—
Baughman, Richard C.; and Bump, David S., 4,489,856, Cl. 222-148.000.

Bunge, Ernst, to U.S. Philips Corporation. Method and arrangement for sound analysis. 4,490,839, Cl. 381-47.000.

Bunk, Axel; and Stadler, Karl, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. Halogen cycle incandescent lamp having an intermediate lead-in conductor part. 4,490,646, Cl. 313-579.000.

Bura, Ernst, to Robert Bosch GmbH. Electronic component and adhesive strip combination, and method of attachment of component to a substrate. 4,489,487, Cl. 29-840.000.

Burbank, Raymond W.: *See*—
Gasparaitis, Bernard V.; Krieg, Larry M.; Schweet, Richard R.; Williams, William R.; and Burbank, Raymond W., 4,490,813, Cl. 365-63.000.

Burdess, James S.; and Maunder, Leonard, to National Research Development Corporation. Gyroscopes. 4,489,609, Cl. 73-505.000.

Burgdorf, Jochen: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Steffes, Helmut; Bleckmann, Hans-Wilhelm; Goosens, Andre F. L.; van Keist, Willi; and Weise, Lutz, 4,489,989, Cl. 303-92.000.

Burkel, Rainer; and Peter, Cornelius, to Robert Bosch GmbH. Apparatus for optimizing operating characteristics of an internal combustion engine. 4,489,690, Cl. 123-419.000.

Burlington Industries, Inc.: *See*—
Titzer, Robert A., 4,489,903, Cl. 242-131.000.

Burndy Corporation: *See*—
Collier, John C.; and Davis, Richard H., 4,490,084, Cl. 414-222.000.

Burr-Brown Inc.: *See*—
Mrozowski, Andrij; and Prazak, Paul R., 4,490,713, Cl. 340-347.0AD.

Burroughs Corporation: *See*—
Andreadakis, Nicholas C., 4,490,647, Cl. 313-586.000.
Lacher, William A., 4,490,821, Cl. 371-1.000.

Buschor, Josef: *See*—
Schmidt, Dieter; Buschor, Josef; and Spillner, Wayne K., 4,489,646, Cl. 99-330.000.

Buschor, Karl; Giesinger, Hans; and Moos, Kurt, to Ransburg-Gema AG. Pressure regulating device for gaseous and liquid fluids. 4,489,749, Cl. 137-487.500.

Buske, Walter E.: *See*—
Brown, Ernest C.; Buske, Walter E.; and Putnam, Norman A., 4,489,506, Cl. 34-57.00A.

Buss, Samuel R.: *See*—
Yianilos, Peter N.; and Buss, Samuel R., 4,490,811, Cl. 364-900.000.

Butler, David V.: *See*—
Orlowski, Jan A.; Butler, David V.; and Kidd, Patrick D., 4,490,115, Cl. 433-199.000.

Butler, James R.: *See*—
Forward, Cleve H.; Butler, James R.; Watson, James M.; and Branum, Gary D., 4,490,570, Cl. 585-467.000.

Butz, David E., to Data Packaging Corporation. Disc pack assembly. 4,490,764, Cl. 360-133.000.

Buzano, Michel; and Danancier, Joanny, to Rhone-Poulenc Fibres. Spun like fiber yarn produced by interlacing. 4,489,542, Cl. 57-206.000.

Buzza, Edmund E., to Beckman Instruments, Inc. Method for measuring ionic concentration utilizing an ion-sensing electrode. 4,490,234, Cl. 204-409.000.

Byrka, Tadeusz: *See*—
Plaskura, Andrzej; Lachman, Ignacy; Byrka, Tadeusz; Leszczynski, Zbigniew; Rogalski, Krzysztof; Koch, Marta; and Zyczynski, Jozef, 4,490,310, Cl. 261-79.00A.

Byrne, Norman R., to Stow & Davis Furniture Company. Electrical connector. 4,489,997, Cl. 339-13.000.

C.I.L. S.A.R.L.: *See*—
Evrard, Paul; Lahille, Michel; and Avenel, Michel, 4,490,497, Cl. 524-349.000.

C. R. Bard, Inc.: *See*—
Robinson, Earl F., 4,490,003, Cl. 339-75.0MP.

C. Reichert Optische Werke AG.: *See*—
Sitte, Helmuth, 4,489,569, Cl. 62-514.00R.

Cabrit, Philippe; Mourlevat, Jean; and de Saint-Palais, Jacques, to Societe Nationale ELF Aquitaine. Connection-disconnection device between one rigid pipe, inside well-tubing connected to a base by an articulated coupling, and another rigid pipe fixed to this base. 4,489,472, Cl. 29-426.500.

Cady, A. Bruce: *See*—
Schemel, John H.; and Cady, A. Bruce, 4,489,497, Cl. 33-172.00E.

Cairo, John B. Foot support for showers. 4,489,448, Cl. 4-574.000.

Calamani, Sergio; and Turri, Eugenio, to Savio & C. S.p.A. Yarn feeding apparatus for multi-feed knitting machines. 4,489,899, Cl. 242-47.010.

Calcagno, Piero, to Comau S.p.A. Apparatus for controlling and programming welding guns. 4,490,795, Cl. 364-477.000.

Calibron Corporation: *See*—
Wolynski, Victor W.; Horian, James G.; and Horian, Robert L., 4,490,761, Cl. 360-128.000.

California Linear Circuits, Inc.: *See*—
Yakura, John, 4,490,111, Cl. 432-205.000.

Calvert, James W.; and Belcher, Samuel, to Cincinnati Milacron Industries, Inc. External center pin for blow molding machine. 4,490,327, Cl. 264-533.000.

Calvert, Rodney K., to Mead Corporation, The. Tapered cup package. 4,489,880, Cl. 229-40.000.

Calzi, Claudio, to Calzi, Claudio. Electrochemical cell provided with selective electrodes and at least one chemical reactor, for indirect measurement of clinical-chemical parameters. 4,490,235, Cl. 204-409.000.

Cam Gears Limited: *See*—
Adams, Frederick J., 4,489,755, Cl. 137-625.220.

Camerik, Eduard: *See*—
Houbregs, Roger J. E.; and Camerik, Eduard, 4,490,011, Cl. 350-255.000.

Cameron Iron Works, Inc.: *See*—
Stevens, Russell E., 4,489,916, Cl. 251-214.000.

Campbell, Randolph E., to E. R. Squibb & Sons, Inc. Ostomy pouch with deodorizing filter. 4,490,145, Cl. 604-333.000.

Canada-Cities Service, Ltd.: *See*—
Stipdonk, Gustaaf, 4,489,828, Cl. 198-847.000.

Canadian Patents & Development Limited: *See*—
Cielo, Paolo G., 4,490,618, Cl. 250-571.000.
Poag, D. W.; and Merritt, W. R., 4,489,663, Cl. 109-76.000.
Taylor, Roderick S.; Leopold, Kurt E.; and Alcock, A. John, 4,490,651, Cl. 315-150.000.

Canalizo, Carlos R.; and Fisher, Ernest P., Jr., to Otis Engineering Corporation. Differential gas lift valve. 4,489,743, Cl. 137-155.000.

Canon Denshi Kabushiki Kaisha: *See*—
Hoshi, Akio, 4,490,758, Cl. 360-105.000.

Canon Kabushiki Kaisha: *See*—
Misumi, Teruo; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Shirai, Shigeru, 4,490,454, Cl. 430-84.000.
Shimizu, Isamu; Arao, Kozo; and Inoue, Eiichi, 4,490,450, Cl. 430-57.000.
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,490,453, Cl. 430-65.000.

Cappel, Bert; Difflipp, Kurt; Emrich, Helmut; Erbach, Horst; Feldt, Wolfgang; Neberle, Klaus; and Ochs, Heinrich, to M.A.N.-Roland Druckmashinen Aktiengesellschaft. Clamping device for clamping printing plates on the plate cylinder of a printing machine. 4,489,653, Cl. 101-415.100.

Captive Plastics, Inc.: *See*—
Drozd, Edward J., Jr., 4,489,843, Cl. 215-252.000.

Cardell, Max L., to Celanese Corporation. Method and apparatus for initiating the winding of filamentary material upon a winder tube. 4,489,898, Cl. 242-18.0PW.

Cares, W. Ronald, to M. W. Kellogg Company, The. Flue gas desulfurization process. 4,490,341, Cl. 423-242.000.

Cargould, Barry D.: *See*—
Beebe, James C.; and Cargould, Barry D., 4,489,598, Cl. 73-146.000.

Carl Freudenberg, Firma: *See*—
Grant, Eric M.; and Walker, John E., 4,490,427, Cl. 428-107.000.
Knoke, Jurgen; Jost, Manfred; Tecl, Bohuslav; and Fahrbach, Erich, 4,490,425, Cl. 428-90.000.

Carl Zeiss-Stiftung: *See*—
Weber, Hieronymus, 4,490,026, Cl. 350-567.000.

Carl-Zeiss-Stiftung, d/b/a Carl Zeiss: *See*—
Riemer, Fritz, 4,490,041, Cl. 356-334.000.

Carl-Zeiss-Stiftung, Heidenheim: *See*—
Weber, Klaus; Gerber, Siegfried; and Fischer, Horst, 4,490,025, Cl. 350-529.000.

Carlson, F. Paul: *See*—
Hare, Alan W.; Murr, Lawrence E.; and Carlson, F. Paul, 4,490,329, Cl. 419-51.000.

Carlson, Randolph S., to Irvine Sensors Corporation. Multiplexer circuitry for high density analog signals. 4,490,626, Cl. 307-243.000.

Carlson, Roy C., Jr.; and March, Edward J., to AT&T Technologies, Inc. Vapor condensation apparatus having condenser coil modules. 4,489,508, Cl. 34-78.000.

Carman, Edward W. Marker. 4,489,669, Cl. 116-202.000.

Carmean, Wes F.: *See*—
Pease, Logan L.; and Carmean, Wes F., 4,490,607, Cl. 250-227.000.

Carr, Travis C.; and Finch, Dale E., to Abbott Laboratories. Intravenous monitoring system utilizing a dynamic reference threshold. 4,490,140, Cl. 604-65.000.

Carre, Jean-Jacques; Courbot, Pierre; and Levrai, Roland, to Societe Anonyme D.B.A. Volumetric screw compressor. 4,490,102, Cl. 418-201.000.

Carter, James G.: *See*—
Christophorou, Loucas G.; Carter, James G.; and Hunter, Scott R., 4,490,650, Cl. 315-150.000.

Casabona, Richard: *See*—
Strecker, William D.; Thompson, David; and Casabona, Richard, 4,490,785, Cl. 364-200.000.

Casdas, Spyridon, to Aluminium de Grece. Process for thermally insulating precalcined anodes in electrolysis cells for the production of aluminum. 4,490,233, Cl. 204-290.00R.

Casey, Donn; and Filshie, Gilbert M., to Simon Population Trust, a part interest. Sexual sterilization devices. 4,489,725, Cl. 128-346.000.

Cassar, Luigi: *See*—
Iqbal, Abul; and Cassar, Luigi, 4,490,542, Cl. 548-453.000.

Castle, Alfred B. Lifting tool. 4,490,088, Cl. 414-457.000.

Catelli, Camillo, to Rossi & Catelli S.p.A. Continuous-cycle aseptic filling machine. 4,489,769, Cl. 141-91.000.

Caterpillar Tractor Co.: *See*—
Bailey, John M.; and Lindenfelser, Dale L., 4,489,687, Cl. 123-269.000.
Hakkenberg, Peter, 4,489,623, Cl. 74-378.000.
Satzler, Ronald L., 4,490,316, Cl. 264-40.700.
Smead, Robert G., 4,489,893, Cl. 239-691.000.

Caumont, Jean-Paul; and Schawann, Jean-Claude, to Societe Nationale Elf Aquitaine (Production). Swivel-joint for the base of a riser-pipe. 4,489,962, Cl. 285-263.000.

Cavill, Barry R.: *See*—
Bigbie, Samuel E.; Cavill, Barry R.; Dodgen, David F.; and Nawy, Albert A., 4,490,796, Cl. 364-519.000.

Celanese Corporation: *See*—
Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,489,543, Cl. 57-208.000.
Cardell, Max L., 4,489,898, Cl. 242-18.0PW.
Chase, Joseph D.; and Wilkison, William W., 4,490,553, Cl. 560-205.000.
Shimp, David A., 4,490,273, Cl. 252-182.000.

Celotex Corporation, The: *See*—
Frentzel, Richard L., 4,490,489, Cl. 521-136.000.

Century Science Corp.: *See*—
Rubin, Ely J.; and Shahak, Israel, 4,490,523, Cl. 536-4.100.

Ceramic Cooling Tower Company: *See*—
Furr, Dale D., 4,490,312, Cl. 261-98.000.

Cerroni, Manlio. Processing apparatus for solid urban refuse and plastic bags filled with same. 4,489,896, Cl. 241-36.000.

Chaconas, Peter C.; and Cowman, George W., to Black & Decker Inc. Cord caddy. 4,489,902, Cl. 242-100.100.

Chaiko, Walter M., to Ingersoll-Rand Company. Friction rock stabilizer and sheathing means, in combination, and method of securing a friction rock stabilizer in an earth bore. 4,490,074, Cl. 405-259.000.

Champ, Robert B.; and Chen, Yau T., to International Business Machines Corporation. Xerographic photoconductors with cross-linked epoxy binder. 4,490,452, Cl. 430-58.000.

Champion International Corporation: *See*—
Mode, Duane, 4,489,878, Cl. 229-27.000.
Mode, Duane R., 4,489,879, Cl. 229-27.000.

Chan, Rebecca L. S.: *See*—
Dawson, Marcia I.; and Chan, Rebecca L. S., 4,490,414, Cl. 424-312.000.

Chandler Evans Inc.: *See*—
Morrison, Terry, 4,490,791, Cl. 364-431.020.

Chaney, Mary B.: *See*—
Stapp, Paul R.; and Chaney, Mary B., 4,490,263, Cl. 252-8.55D.

Chang, Chi Ming. Sandwich wall structure and the method for constructing the same. 4,489,530, Cl. 52-741.000.

Chang, Clarence D.; and Pelrine, Bruce P., to Mobil Oil Corporation. Production of phenol. 4,490,565, Cl. 568-798.000.

Chang, Clarence D.; and Pelrine, Bruce P., to Mobil Oil Corporation. Production of phenol. 4,490,566, Cl. 568-798.000.

Chang, James C.: *See*—
Bergquist, Barton L.; and Chang, James C., 4,490,543, Cl. 549-212.000.

Chaplin, George B. B.; and Smith, Roderick A., to Sound Attenuators Limited. Method and apparatus for cancelling vibrations. 4,490,841, Cl. 381-71.000.

Charlebois, Leonard J.; Scott, James R.; and Barber, Robert J., to Northern Telecom Limited. Retainer for packaged optical fiber splices and organizing tray utilizing such retainers. 4,489,830, Cl. 206-316.000.

Charlebois, Leonard J.; and Huszarik, Fred A., to Northern Telecom Limited. Methods of moulding of plastics articles. 4,490,315, Cl. 264-40.100.

Charles A. Breskin Assoc. Inc.: *See*—
Breskin, Charles A., 4,489,844, Cl. 215-329.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
Youmans, Douglas G., 4,490,730, Cl. 346-76.00L.

Chase, Joseph D.; and Wilkison, William W., to Celanese Corporation. Process for production of ethyl acrylate. 4,490,553, Cl. 560-205.000.

Chase, Paul H.: *See*—
Snyder, Troxell K.; and Chase, Paul H., 4,489,562, Cl. 60-667.000.

Chatzitheodorou, Georg: *See*—
Kossmehl, Gerhard; and Chatzitheodorou, Georg, 4,490,509, Cl. 525-328.500.

Chemplex Company: *See*—
Hoff, Raymond E.; and Pullukat, Thomas, 4,490,514, Cl. 526-165.000.

Chen, Lee; Chuang, Tung J.; and Mathad, Gangadhara S., to International Business Machines Corporation. Laser induced dry chemical etching of metals. 4,490,210, Cl. 156-643.000.

Chen, Lee; Lankard, John R.; and Mathad, Gangadhara S., to International Business Machines Corporation. Laser induced chemical etching of metals with excimer lasers. 4,490,211, Cl. 156-643.000.

Chen, Li Fu: *See*—
Gong, Cheng Shung; Chen, Li Fu; Flickinger, Michael C.; and Tsao, George T., 4,490,468, Cl. 435-161.000.

Chen, Yau T.: *See*—
Champ, Robert B.; and Chen, Yau T., 4,490,452, Cl. 430-58.000.

Cheng, Chen-Yen: *See*—
Cheng, Sing-Wang; and Cheng, Chen-Yen, 4,489,571, Cl. 62-542.000.

Cheng, Paul J., to Phillips Petroleum Company. Method for producing carbon black. 4,490,346, Cl. 423-456.000.

Cheng, Richard M. H.: *See*—
Fahim, Atef E. F.; Lee, Rock S. Y.; and Cheng, Richard M. H., 4,489,792, Cl. 173-48.000.

Cheng, Sing-Wang; and Cheng, Chen-Yen. Fractional solidification process and apparatuses for use therein. 4,489,571, Cl. 62-542.000.

Cherednichok, Vitaly T.: *See*—
Kuchuk-Yatsenko, Sergei I.; Krivenko, Valery G.; Bogorsky, Mikhail V.; Lazebny, Ivan L.; Porkhun, Fedor K.; Sakharnov, Vasily A.; and Cherednichok, Vitaly T., 4,490,081, Cl. 409-300.000.

Chertok, Allan; Gjertsen, John, Sr.; and Manfredi, Louis, to U.S. Windpower, Inc. Windpower system. 4,490,093, Cl. 416-26.000.

Cherukuri, S. Rao; Bilka, Kenneth P.; Hriscisce, Frank; and Piccolo, Dominic J., to Warner-Lambert Company. Chewing gum with improved stability. 4,490,395, Cl. 426-3.000.

Chester, Arthur W.: *See*—
Chu, Yung F.; and Chester, Arthur W., 4,490,569, Cl. 585-415.000.

Chevalier, Philippe, to Schlumberger Technology Corporation. Method and apparatus for analyzing well fluids by photon irradiation. 4,490,609, Cl. 250-269.000.

Chevillat, Pierre R.; Kaser, Hans P.; Maiwald, Dietrich G. U.; and Ungerbock, Gottfried, to International Business Machines Corporation. Arithmetic device for concurrently summing two series of products from two sets of operands. 4,490,807, Cl. 364-736.000.

Chik, Kiu-Chi D.; Devenyi, Tibor F.; and Dyment, John C., to Northern Telecom Limited. Method for screening laser diodes. 4,489,477, Cl. 29-569.00L.

Child, Edward T.: *See*—
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,490,156, Cl. 48-61.000.

Children's Hospital Medical Center: *See*—
Clark, Leland C., Jr., 4,490,351, Cl. 424-5.000.

Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara R.T.: *See*—
Ambrus, Dezso ; Szabolcsi, Tamas; and Hutas, Istvan, 4,490,394, Cl. 426-2.000.

Chisholm, Douglas B. Couplings for sign posts and the like. 4,490,062, Cl. 403-2.000.

Choinski, Edward J., to Polaroid Corporation. Coating apparatus. 4,489,671, Cl. 118-412.000.

Cholvin, Robert L.; McInerney, Charles E.; Nascarrow, James N.; and Gantz, Jack L., to Garrett Corporation, The. Supercharged diesel engine air flow control system. 4,489,702, Cl. 123-564.000.

Chorney, Alvan F., to Ferrofluidics Corporation. Ferrofluid-pole-piece-magnet apparatus. 4,489,950, Cl. 277-80.000.

Chou, Tai-Sheng, to Mobil Oil Corporation. Secondary injection of ZSM-5 type zeolite in catalytic cracking. 4,490,241, Cl. 208-75.000.

Chowhan, Zaka-Ud-Din T., to Syntex (U.S.A.) Inc. Acid stabilized compositions of thieno-pyridine derived compounds. 4,490,377, Cl. 424-256.000.

Chrisman, Charles L.: *See*—
Wolters, William R.; Chrisman, Charles L.; and Libey, George S., 4,489,674, Cl. 119-3.000.

Christophersen, Steven L., to Snap-on Tools Corporation. Bracket qualifier device. 4,489,498, Cl. 33-180.0AT.

Christophorou, Loucas G.; Carter, James G.; and Hunter, Scott R., to United States of America, Energy. Gas mixture for diffuse-discharge switch. 4,490,650, Cl. 315-150.000.

Chu, Yung F.; and Chester, Arthur W., to Mobil Oil Corporation. Process for converting propane to aromatics over zinc-gallium zeolite. 4,490,569, Cl. 585-415.000.

Chuang, Tung J.: *See*—
Chen, Lee; Chuang, Tung J.; and Mathad, Gangadhara S., 4,490,210, Cl. 156-643.000.

Ciba-Geigy AG: *See*—
Acklin, Leo; and Rossier, Marcel, 4,490,030, Cl. 354-322.000.
Skudelny, Dieter; and Rauth, Gerhard, 4,490,492, Cl. 523-443.000.
Webb, Terence C.; Lovell, Peter A.; and Kingston, Samuel B., 4,490,461, Cl. 430-510.000.

Ciba-Geigy Corporation: *See*—
Falk, Robert A., 4,490,304, Cl. 260-457.000.
Ghisalba, Oreste; Heinzer, Franz; and Kuenzi, Martin, 4,490,471, Cl. 435-253.000.
Hoegerle, Karl; Gsell, Laurenz; and Wehrli, Rudolf, 4,490,375, Cl. 424-251.000.
Iqbal, Abul; and Cassar, Luigi, 4,490,542, Cl. 548-453.000.
Laanio, Verena; von Orelli, Marcus; and Hausermann, Walter, 4,490,372, Cl. 424-249.000.
Pissiotas, Georg; and Rohr, Otto, 4,490,167, Cl. 71-105.000.
Schreiber, Werner; and Marky, Michael, 4,490,562, Cl. 568-637.000.

Cielo, Paolo G., to Canadian Patents & Development Limited. Optical system for analyzing the surface of a fibrous web. 4,490,618, Cl. 250-571.000.

Cincinnati Milacron Inc.: *See*—
Kimmelaar, Rudolf J. A., 4,490,054, Cl. 384-117.000.

Cincinnati Milacron Industries, Inc.: *See*—
Calvert, James W.; and Belcher, Samuel, 4,490,327, Cl. 264-533.000.

Cipollina, John J.; and Jerrold, Laurance E. Cephalometric shield. 4,490,616, Cl. 250-515.100.

Circom, Inc.: *See*—
Bednarz, John J.; and Bloodworth, William T., 4,490,583, Cl. 179-99.00R.

Circuits & Systems, Inc.: *See*—
Gordon, Arnold S., 4,489,797, Cl. 177-128.000.

Clarion Co., Ltd.: *See*—
Watanabe, Tatsuya, 4,490,842, Cl. 381-86.000.

Clark, Frederic L.; and Wallace, David B., to Mead Corporation, The. Ink jet printer. 4,490,729, Cl. 346-75.000.

Clark, Leland C., Jr., to Children's Hospital Medical Center. Methods of treating disorders of an eye with liquid perfluorocarbons. 4,490,351, Cl. 424-5.000.

Clarke, Charles J., Jr.: *See*—
Staggs, Kevin P.; and Clarke, Charles J., Jr., 4,490,797, Cl. 364-522.000.

Cleeves, James M.: *See*—
Keyser, Thomas; Thomas, Michael E.; Pierce, John M.; and Cleeves, James M., 4,489,482, Cl. 29-591.000.

Cloutier, Frank L.: *See*—
Vaught, John L.; Cloutier, Frank L.; Donald, David K.; Meyer, John D.; Tacklind, Christopher A.; and Taub, Howard H., 4,490,728, Cl. 346-1.100.

Code Manufacturing, Inc.: *See*—
Boetger, Ronald L., 4,489,855, Cl. 222-5.000.

Coffey, Gerald P.; Sentman, Robert C.; and Curatolo, Benedict S., to Standard Oil Company, The. Preparation of spinnable polyamide from dinitrile/diamine/water with metal salt of oxygenated phosphorus compound catalyst. 4,490,521, Cl. 528-336.000.

Coffing, Samuel F., to International Resources Management, Inc. Flotation apparatus and process utilizing a novel mixing and floc dispersion means. 4,490,259, Cl. 210-704.000.

Cole, Robert C., to Halliburton Company. Method of completing a well bore penetrating a subterranean formation. 4,489,785, Cl. 166-295.000.

Coleman, Robert L.; and Schneider, Charles F., to Emanuel S. Kardos. Method of making bags. 4,490,131, Cl. 493-217.000.

Colgate-Palmolive Company: *See*—
Crawford, Richard J.; Yuhasz, Kathleen M.; and Curtis, John P., 4,490,353, Cl. 424-52.000.
Joshi, David P.; and Divone, Peter A., 4,490,280, Cl. 252-368.000.

Collange, Edmond; Paris, Michel; and Autissier, Nicole, to Spiral Societe a Responsabilite Limitee dite. Process for preparing iodothyronines and iodothyroacetic acids by electrochemical reduction at controlled potential. 4,490,221, Cl. 204-72.000.

Collier, John C.; and Davis, Richard H., to Burndy Corporation. Wire transfer mechanism. 4,490,084, Cl. 414-222.000.

Collins, Byron R.; and Dryman, William K., to General Electric Company. Luminaire globe assembly. 4,490,778, Cl. 362-267.000.

Colquist, Russell W., to Bio-Medical Innovations, Inc. Canine cervical jacket. 4,489,676, Cl. 119-96.000.

Comau S.p.A.: *See*—
Calcagno, Piero, 4,490,795, Cl. 364-477.000.

Combustion Engineering, Inc.: *See*—
Fernandes, John H., 4,490,157, Cl. 48-62.00R.
Holt, Fletcher O., 4,489,679, Cl. 122-451.00S.
Snyder, Troxell K.; and Chase, Paul H., 4,489,562, Cl. 60-667.000.
Sump, Cord H., 4,489,877, Cl. 228-178.000.
Ullrich, Ray D.; Sherman, Douglas C.; and Licon, Leo, Jr., 4,490,065, Cl. 403-379.000.

Comeaux, Roy V.; Leighton, Milton D.; and Ryan, Douglas G., to Exxon Research and Engineering Co. Removal of corrodants from NMP solvent by contacting with sacrificial metal. 4,490,240, Cl. 208-47.000.

Commonwealth Scientific and Industrial Research Organization: *See*—
Kirby, Kevin D.; and Mardon, Christopher J., 4,490,469, Cl. 435-161.000.

Commonwealth Scientifique & Industrial Research Organization: *See*—
Panaretto, Basil A.; Moore, Geoffrey P. M.; and Robertson, Duncan M., 4,490,365, Cl. 424-177.000.

Compressor Valve Services, Inc.: *See*—
Deminski, Richard M., 4,489,752, Cl. 137-512.100.

Conly, Douglas J.; Baker, Bonnie B.; Larson, David D.; and Riddle, Stanley T., to International Business Machines Corporation. Modulated light printing. 4,490,032, Cl. 355-14.00R.

Conoco Inc.: *See*—
Sweeney, William T., 4,489,757, Cl. 137-877.000.
Yang, Kang; Starks, Charles M.; and Kerfoot, O. Carl, 4,490,561, Cl. 568-615.000.

Constantine, Neil V.: *See*—
Norton, Terry L.; and Constantine, Neil V., 4,489,996, Cl. 312-279.000.

Container Corporation of America: *See*—
Helms, Charles R., 4,489,832, Cl. 206-387.000.

Controlonics Corporation: *See*—
Lucey, Robert E., 4,490,584, Cl. 179-100.00L.

Cook, James W., to Square D Company. Arrangement for arc transfer in high amperage molded case circuit breaker. 4,490,593, Cl. 200-144.00R.

Cooper Industries, Inc.: *See*—
Page, Paul F., 4,490,591, Cl. 200-68.200.

Cooper, John; and Mumme-Young, Colin A., to Imperial Chemical Industries PLC. Emulsion explosive composition. 4,490,194, Cl. 149-2.000.

Cooper, John; Reid, David S.; Mumme-Young, Colin A.; and Gregson, Robert D., to Imperial Chemical Industries PLC. Emulsion explosive composition. 4,490,195, Cl. 149-2.000.

Cooper, Keith A.: *See*—
Gordon, Robert L.; Maugle, George H.; and Cooper, Keith A., 4,489,537, Cl. 53-511.000.

Cooper LaserSonics, Inc.: *See*—
Kloesattel, Claus; and Warrin, George E., 4,490,114, Cl. 433-105.000.

Cooper, Paul W.: *See*—
Struttmann, Hilarious S.; Donahue, Kenneth R.; and Cooper, Paul W., 4,489,475, Cl. 29-526.00R.

Cooper, Robin D. G.; Blaszczak, Larry C.; and Turner, Jan R., to Eli Lilly and Company. Naphthylglycyl cephalosporin derivatives. 4,490,370, Cl. 424-246.000.

Cooper, William B. Saw mill improvements. 4,489,635, Cl. 83-708.000.

Coppens, Anton; and Poldervaart, Leendert, to Single Buoy Moorings Inc. Mooring system. 4,490,121, Cl. 441-5.000.

Corboy, Thomas A.; and Philipson, Joseph. Conductive paint composition. 4,490,282, Cl. 252-503.000.

Corning Glass Works: *See*—
Weetall, Howard H., 4,490,399, Cl. 426-330.400.

Corti, Miguel; and Mayhew, Raymond L., to Mona Industries, Inc. Salt free phosphobetaines. 4,490,536, Cl. 548-112.000.

Cosden Technology, Inc.: *See*—
Forward, Cleve H.; Butler, James R.; Watson, James M.; and Branum, Gary D., 4,490,570, Cl. 585-467.000.

Costa, Armando; and Verani, Giovanni, to Ing. C. Olivetti & C., S.p.A. Device for automatically positioning a sheet on a platen of an office machine. 4,489,931, Cl. 271-277.000.

Coston, Charles J.; and Higgins, Euel V., to Lockheed Missiles & Space Company, Inc. Temperature threshold detector. 4,490,053, Cl. 374-5.000.

Cosyns, Jean: *See*—
Boitiaux, Jean-Paul; and Cosyns, Jean, 4,490,481, Cl. 502-330.000.

Courbot, Pierre: *See*—
Carre, Jean-Jacques; Courbot, Pierre; and Levrai, Roland, 4,490,102, Cl. 418-201.000.

Coussement, Marc: *See*—
De Schepper, Achille; and Coussement, Marc, 4,490,338, Cl. 423-54.000.

Cowman, George W.: *See*—
Chaconas, Peter C.; and Cowman, George W., 4,489,902, Cl. 242-100.100.

Cozad, Harley R., to FMC Corporation. Low droop multi-part pendant supported boom. 4,489,838, Cl. 212-264.000.

Crama, Willem J.; and Baas, Albertus H. Process for the preparation of a ferronickel concentrate. 4,490,174, Cl. 75-82.000.

Cramp, John H. W., to Imperial Chemical Industries PLC. Method of and apparatus for monitoring gaseous pollutants. 4,490,043, Cl. 356-407.000.

Crawford, John O.; and Gravener, Roy D., to United States Surgical Corporation. Self-centering surgical staple and stapler for applying the same. 4,489,875, Cl. 227-19.000.

Crawford, Richard J.; Yuhasz, Kathleen M.; and Curtis, John P., to Colgate-Palmolive Company. Antiplaque dentifrice with improved fluoride stability. 4,490,353, Cl. 424-52.000.

Crepinsek, Alois. Coupling of keyway rosette to lock body. 4,489,577, Cl. 70-452.000.
Crompton and Knowles Corporation: *See*—
Brode, David A., 4,490,151, Cl. 8-639.000.
Cron Chemical Corporation: *See*—
Sanders, John T.; and Stewart, Donald L., 4,490,049, Cl. 366-134.000.
Cronin, Thomas B. Hull construction. 4,489,668, Cl. 114-347.000.
Cronquist, Donald H., Jr.: *See*—
Perrin, Lloyd E.; and Cronquist, Donald H., Jr., 4,489,819, Cl. 198-403.000.
Crosfield Electronics Limited: *See*—
Yeadon, Edward C.; and Laciny, Richard W., 4,490,608, Cl. 250-235.000.
Cross, Barrington: *See*—
Spatz, David M.; and Cross, Barrington, 4,490,165, Cl. 71-88.000.
Crouch, William B.: *See*—
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,490,156, Cl. 48-61.000.
Crowson, James A., to Robertshaw Controls Company. Method of making an electrical current input to a pneumatic signal output transducer construction. 4,489,483, Cl. 29-602.00R.
Culp, Charles R.; and Mearig, Stephen G., to Armstrong World Industries, Inc. Method of making a stencil plate. 4,490,217, Cl. 204-11.000.
Cummings, Lowell O. Epoxy curing agents, method for making them, method of curing epoxy resins, and cured epoxy resins. 4,490,510, Cl. 525-490.000.
Cummins, Bruce M., to Skytop Brewster Company. Drill rig elevating floor structure. 4,489,526, Cl. 52-125.600.
Curatolo, Benedict S.: *See*—
Coffey, Gerald P.; Sentman, Robert C.; and Curatolo, Benedict S., 4,490,521, Cl. 528-336.000.
Curatolo, Luigi: *See*—
Glembin, Dirk; Kappler, Fritz-Robert; Curatolo, Luigi; and Trapani, Vittorio, 4,490,343, Cl. 423-336.000.
Curtinot, Jean-Claude: *See*—
Bensussan, Andre; Birot, Patrice; Van Kerrebroeck, Claude; and Curtinot, Jean-Claude, 4,490,854, Cl. 455-118.000.
Curtis, Joel E. Recessed garbage can container. 4,489,810, Cl. 187-3.000.
Curtis, John P.: *See*—
Crawford, Richard J.; Yuhasz, Kathleen M.; and Curtis, John P., 4,490,353, Cl. 424-52.000.
Cuscurida, Michael: *See*—
Sung, Rodney L.; Yeakey, Ernest L.; Foucher, Walter D., Jr.; and Cuscurida, Michael, 4,490,154, Cl. 44-70.000.
Cush, Roger J., to Dow Corning Limited. Silicone elastomer forming compositions. 4,490,488, Cl. 521-88.000.
Cushman, Robert P.; and Cushman, Robert P., Jr. Portable highway warning apparatus. 4,490,069, Cl. 404-15.000.
Cushman, Robert P., Jr.: *See*—
Cushman, Robert P.; and Cushman, Robert P., Jr., 4,490,069, Cl. 404-15.000.
Daghe, Joseph L.; Sands, Robert E.; and Humes, Dennis W., to Mueller Co. Backflow preventer apparatus. 4,489,746, Cl. 137-218.000.
Dahowski, Donald E., to Quaker Plastic Corporation. Modular drain system. 4,490,067, Cl. 404-4.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Honda, Makoto; Izawa, Akira; and Moriguchi, Yutaro, 4,490,010, Cl. 350-128.000.
Takeuchi, Hideo; Kobayashi, Michiaki; Hashimoto, Hiroyuki; and Suzuki, Daiji, 4,489,652, Cl. 101-211.000.
Daime, Jean P.; and Lecler, Martial H., to S.N.E.C.M.A. Monitoring device and process of a metallic part superplastic forming. 4,489,579, Cl. 72-38.000.
Dainippon Ink & Chemicals, Inc.: *See*—
Kawabata, Juheiji; Inoue, Toshio; Sugie, Toshinori; and Kobata, Fumihiro, 4,490,522, Cl. 528-388.000.
Daisaku, Takehiko: *See*—
Tanaka, Susumu; Daisaku, Takehiko; and Suda, Yoshihide, 4,490,112, Cl. 433-20.000.
Dal Monte, Antonio. Gymnastic implement. 4,489,936, Cl. 272-120.000.
Dale, John D.: *See*—
Lipsky, Steven; and Dale, John D., 4,490,138, Cl. 604-40.000.
Dana-Farber Cancer Institute, Inc.: *See*—
Rosowsky, Andre, 4,490,529, Cl. 544-260.000.
Danancier, Joanny: *See*—
Buzano, Michel; and Danancier, Joanny, 4,489,542, Cl. 57-206.000.
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Honty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos, to Richter Gedeon Vegyeszeti Gyar Rt. N-Desmethyl-N-(allyloxymethyl)-vinblastine and antileukemic and antilymphomic compositions and method of treatment. 4,490,378, Cl. 424-262.000.
D'Andrea, Ermanno: *See*—
D'Andrea, Nicola; D'Andrea, Ermanno; Adriano, Castellini; and Ferdinando, Medea, 4,489,629, Cl. 82-1.200.
D'Andrea, Nicola; D'Andrea, Ermanno; Adriano, Castellini; and Ferdinando, Medea, to D'Andrea S.p.A. Boring and facing head as well as a machine designed for receiving this head. 4,489,629, Cl. 82-1.200.
D'Andrea S.p.A.: *See*—
D'Andrea, Nicola; D'Andrea, Ermanno; Adriano, Castellini; and Ferdinando, Medea, 4,489,629, Cl. 82-1.200.
Daniels, Donald V.: *See*—
Harrison, Joel N.; Daniels, Donald V.; and Brown, David A., 4,490,635, Cl. 310-38.000.
Danno, Yoshiaki: *See*—
Kinoshita, Mitsutaka; Nakagami, Tatsuro; Murakami, Nobuaki; Endo, Norio; Tamura, Fumio; and Danno, Yoshiaki, 4,489,685, Cl. 123-198.00F.
Darley, Henry M.: *See*—
Everett, Chauncey L.; Houston, Theodore W.; and Darley, Henry M., 4,490,632, Cl. 307-475.000.
Darzinskis, Kazimir R. Video computer system controlled by operation of elastomeric exercise apparatus. 4,489,938, Cl. 272-142.000.
Data Packaging Corporation: *See*—
Butz, David E., 4,490,764, Cl. 360-133.000.
Dauben, William G.; Jeffries, Phillip R.; and Phillips, Richard B., to University of California, The Regents of The. Efficient photochemical formation of 1-α-hydroxyprevitamin D_3. 4,490,226, Cl. 204-159.000.
Daugherty, Donald H. Can compacter. 4,489,649, Cl. 100-215.000.
Daughters, James R., to Wordex. Ribbon metering device. 4,490,059, Cl. 400-208.000.
Davidovich, Alexandr N.; Schukin, Valery Y.; Klushin, Valery A.; Sadko, Vladimir I.; Skrebets, Nikolai M.; and Murashko, Evgeny T., to Fiziko-Tekhnichesky Institut Akademi Nauk Belorusskoi SSR. Method of manufacturing articles by deformation of cylindrical blanks. 4,489,581, Cl. 72-70.000.
Davies, Gareth M.: *See*—
Jung, Frederic H.; and Davies, Gareth M., 4,490,382, Cl. 424-270.000.
Davies, Gwilym R.; and Williams, Alfred G., to Imperial Chemical Industries PLC. Preparation of selected epoxides. 4,490,222, Cl. 204-78.000.
Davis, C. Paul: *See*—
Neuman, Eli; and Davis, C. Paul, 4,490,767, Cl. 360-137.000.
Davis, Charles, to Aaxon Industrial, Inc. Low pressure HEPA filtration system for particulate matter. 4,490,162, Cl. 55-213.000.
Davis, Lorne A., Jr.; Brost, Dale F.; and Haskin, Helen K., to Texaco Inc. Microwave means for monitoring fluid in a core of material. 4,490,676, Cl. 324-376.000.
Davis, Michael A.: *See*—
Vitzthum, Gunter H.; and Davis, Michael A., 4,490,431, Cl. 428-220.000.
Davis, R. Melvin, to Weatherchem Corporation. Interference stop punch-out closure. 4,489,864, Cl. 222-541.000.
Davis, Richard H.: *See*—
Collier, John C.; and Davis, Richard H., 4,490,084, Cl. 414-222.000.
Davison, Ellard D., Jr., to General Motors Corporation. Vehicle drive train test apparatus. 4,489,597, Cl. 73-118.000.
Davol, Inc.: *See*—
Nehring, John R., 4,489,750, Cl. 137-496.000.
Dawson, Daniel J.; and Otteson, Kenneth M., to Dynapol. Ethylidene bisformamide, its preparation and use in preparing poly(vinylamine) and salts thereof. 4,490,557, Cl. 564-159.000.
Dawson, Marcia I.; and Chan, Rebecca L. S., to SRI International. Open chain analogues of retinoic acid. 4,490,414, Cl. 424-312.000.
Dayco Corporation: *See*—
Bryan, James S., 4,489,885, Cl. 238-349.000.
Long, Delmar D., 4,490,428, Cl. 428-110.000.
Dean, Raymond H.; and Roberts, Michael M., to Tempmaster Corporation. Air delivery system for hospital rooms and the like. 4,489,881, Cl. 236-49.000.
Dean Research Corporation: *See*—
Henke, John R., 4,489,970, Cl. 294-67.0AB.
Dean, Richard T.; Dorn, Conrad P., Jr.; and Shen, Tsung-Ying, to Merck & Co., Inc. Imino ethers. 4,490,303, Cl. 260-453.990.
Dean, Robert H.: *See*—
West, Michael D.; and Dean, Robert H., 4,489,915, Cl. 251-161.000.
Dees, John R.: *See*—
Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,489,543, Cl. 57-208.000.
deFasselle, Craig R.: *See*—
deFasselle, Robert J.; and deFasselle, Craig R., 4,489,614, Cl. 73-861.540.
deFasselle, Robert J.; and deFasselle, Craig R. Flowmeter. 4,489,614, Cl. 73-861.540.
De Freitas, Elias M., to Termolar S/A. Isothermal container with a cup-shaped top. 4,489,840, Cl. 215-13.00R.
Degn, Kaj; and Waldstrom, Ejvind, to O. G. Hoyer A/S. Packaging method. 4,489,536, Cl. 53-450.000.
Degussa Aktiengesellschaft: *See*—
Klenk, Herbert, 4,490,307, Cl. 260-465.100.
DeHarrold, Raymond H.: *See*—
Hennings, George N.; Nickles, Richmond H.; Brauer, Larry F.; and DeHarrold, Raymond H., 4,489,656, Cl. 102-254.000.
Deimel, Helmut; and Schulein, Rolf G., to ITT Industries, Inc. Height adjustment means for a cylindrical brush in a carpet sweeper. 4,489,457, Cl. 15-41.00R.
Delam, Heinz, to GERB Gesellschaft fur Isolierung mbH & Co. KG. Elastic support for machines. 4,489,991, Cl. 384-428.000.
Del Bagno, Anthony C.; Giordano, Richard R.; and Rose, Frederick. Heat pipe having multiple integral wick structures. 4,489,777, Cl. 165-104.260.
Delphian Corporation: *See*—
Hadden, David M., 4,489,590, Cl. 73-1.00G.

De Luca, Albert M.; and Buan, Danilo P., to Pitney Bowes Inc. Mailing machine having an envelope stripping device. 4,489,651, Cl. 101-93.360.

Demidenko, Vladimir A.: *See*—
Volynets, Filipp K.; Demidenko, Vladimir A.; Denisov, Roman A.; Denx, Viktor P.; Dydelzak, Alexandr E.; Ryzhikov, Engels N.; and Terentieva, Evgenia A., 4,490,286, Cl. 252-583.000.

Desmnski, Richard M., to Compressor Valve Services, Inc. Guard guided multiple element flow configured poppet valve. 4,489,752, Cl. 137-512.100.

Dessus, Dietrich: *See*—
Schubert, Herrmann; Deutscher, Hans-Joachim; Kresse, Horst; Demus, Dietrich; Altmann, Heinz; Korber, Marlies; and Bottger, Ute, 4,490,278, Cl. 252-299.630.

Denisov, Roman A.: *See*—
Volynets, Filipp K.; Demidenko, Vladimir A.; Denisov, Roman A.; Denx, Viktor P.; Dydelzak, Alexandr E.; Ryzhikov, Engels N.; and Terentieva, Evgenia A., 4,490,286, Cl. 252-583.000.

Denx, Viktor P.: *See*—
Volynets, Filipp K.; Demidenko, Vladimir A.; Denisov, Roman A.; Denx, Viktor P.; Dydelzak, Alexandr E.; Ryzhikov, Engels N.; and Terentieva, Evgenia A., 4,490,286, Cl. 252-583.000.

Derman, Karl G. Tension spring device. 4,489,548, Cl. 59-79.100.

de Ronde, Frans C., to U.S. Philips Corporation. Wideband power adder-divider for high-frequency circuits and impedance transformer realized on the basis of the adder-divider. 4,490,695, Cl. 333-128.000.

Desai, Bharat B., to Miranol Chemical Company, Inc. Betaine based cosmetic formulations. 4,490,355, Cl. 424-70.000.

de Saint-Palais, Jacques: *See*—
Cabrit, Philippe; Mourlevat, Jean; and de Saint-Palais, Jacques, 4,489,472, Cl. 29-426.500.

De Schepper, Achille; and Coussement, Marc, to Metallurgie Hoboken-Overpelt. Process for separating trivalent iron from an aqueous chloride solution. 4,490,338, Cl. 423-54.000.

DeSoto, Inc.: *See*—
Devona, James E.; and Esaigmann, Martin L., 4,490,491, Cl. 523-318.000.

Deutsch, Allan S.; and Musikant, Barry L. Dental post and wrench therefor and method of restoring bulk to a tooth root therewith. 4,490,116, Cl. 433-215.000.

Deutsch, Ralph, to Kawai Musical Instruments Mfg. Co., Ltd. Percussive voice generator for an electronic musical instrument. 4,489,637, Cl. 84-1.220.

Deutsch, Robert W.; and Martinsons, Robert, to Motorola, Inc. Acceleration fuel enrichment system. 4,490,792, Cl. 364-431.070.

Deutsche Babcock Anlagen Aktiengesellschaft: *See*—
Seesale, Roland; and Maier, Werner, 4,489,754, Cl. 137-528.000.

Deutscher, Hans-Joachim: *See*—
Schubert, Herrmann; Deutscher, Hans-Joachim; Kresse, Horst; Demus, Dietrich; Altmann, Heinz; Korber, Marlies; and Bottger, Ute, 4,490,278, Cl. 252-299.630.

Develay, Roger, to Aluminium Pechiney. Method of manufacturing stamped-out or forged parts made of aluminum alloys. 4,490,189, Cl. 148-12.70A.

Devenyi, Tibor F.: *See*—
Chik, Kiu-Chi D.; Devenyi, Tibor F.; and Dyment, John C., 4,489,477, Cl. 29-569.00L.

Devona, James E.; and Esaigmann, Martin L., to DeSoto, Inc. Vinylidene chloride-containing copolymer latices. 4,490,491, Cl. 523-318.000.

Dezseri, Eszter: *See*—
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Honty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos, 4,490,378, Cl. 424-262.000.

Dhein, Rolf: *See*—
Hentschel, Karl-Heinz; Mussig, Bernhard; Dhein, Rolf; and Kussi, Siegfried, 4,490,266, Cl. 252-49.800.

Diamond Automations, Inc.: *See*—
Siciliano, Anthony J., 4,489,675, Cl. 119-22.000.

Diamond Brand Canvas Products Co., Inc.: *See*—
Korte, Gerald A., 4,489,866, Cl. 224-155.000.

Dickinson, Harry D. Hydraulic safety barrier traffic-way controller. 4,490,068, Cl. 404-6.000.

Dickinson, William D.; Mioduszewski, David; and Bernardin, Frederick E., Jr., to Quantitative Environmental Decisions Corporation. Fluid sampling apparatus. 4,489,779, Cl. 166-64.000.

Diem, Winfried, to Eirich, Hubert; Eirich, Paul; and Eirich, Walter. Device for the controllable removal of bulk materials from containers. 4,489,862, Cl. 222-263.000.

Dies, Rainer; and Asmussen, Bodo, to Beiersdorf Aktiengesellschaft. Diuretic and antihypertensive composition comprising xipamide and triamterene. 4,490,368, Cl. 424-232.000.

Diesel Kiki Co., Ltd.: *See*—
Kawatei, Hisatsugu, 4,489,697, Cl. 123-502.000.
Okazaki, Michio, 4,490,100, Cl. 418-98.000.
Yamada, Keiichi, 4,489,684, Cl. 123-198.00F.

Dietrich, Bernhard; Matsushita, Hidetoshi; and Mori, Tetsuo, to SDS-Elektro GmbH; and Matsushita Electric Works, Ltd. Electromagnetic switchgear comprising a magnetic drive and a contact apparatus placed thereabove. 4,490,701, Cl. 335-78.000.

Dietrich, Otto E. Vise having adjustable features. 4,489,928, Cl. 269-251.000.

Difflipp, Kurt: *See*—
Cappel, Bert; Difflipp, Kurt; Emrich, Helmut; Erbach, Horst; Feldt, Wolfgang; Neberle, Klaus; and Ochs, Heinrich, 4,489,653, Cl. 101-415.100.

Diggins, James R. Nibbling tool for shearing sheet material. 4,489,492, Cl. 30-241.000.

Digital Equipment Corporation: *See*—
Strecker, William D.; Thompson, David; and Casabona, Richard, 4,490,785, Cl. 364-200.000.

Dijkmans, Eise C.: *See*—
van de Plassche, Rudy J.; and Dijkmans, Eise C., 4,490,714, Cl. 340-347.0DA.

Dikta, Gerd, to Mannesmann AG. Feeding electric current to twin-vessel arc furnaces. 4,490,827, Cl. 373-103.000.

Dillon, Joseph C. Flexible, non-kinkable hose and method for making the same. 4,490,200, Cl. 156-143.000.

Dilly, David A. Dimmer control switch assembly for lamps and the like. 4,490,625, Cl. 307-116.000.

Dimeff, John, to Mark Telephone Products, Inc. Differential amplifier with common mode rejection means. 4,490,686, Cl. 330-258.000.

Divone, Peter A.: *See*—
Joshi, David P.; and Divone, Peter A., 4,490,280, Cl. 252-368.000.

Dixon, Jerry D.; Marazas, Gerald A.; and Merckel, Gerald U., to International Business Machines Corporation. I/O Storage controller cache system with prefetch determined by requested record's position within data block. 4,490,782, Cl. 364-200.000.

Dizon, Edmund S.: *See*—
Beebe, Emmett R.; Dizon, Edmund S.; and Kalvaitis, Arvydas J., 4,489,966, Cl. 292-334.000.

Dobrusskin, Alexander; and Marsen, Georg, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. High-pressure sodium discharge lamp. 4,490,642, Cl. 313-25.000.

Dobson Park Industries PLC.: *See*—
Allen, Archelaius D., 4,490,076, Cl. 405-289.000.

Dockery, Denzel J., to Vortex Innerspace Products. Aquarium filtering system. 4,490,250, Cl. 210-169.000.

Dr. Karl Thomae Gesellschaft mit beschrankter Haftung: *See*—
Reiffen, Manfred; Heider, Joachim; Hauel, Norbert; Austel, Volkhard; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Noll, Klaus; Pieper, Helmut; Kruger, Gerd; and Keck, Johannes, 4,490,369, Cl. 424-244.000.

Dodgen, David F.: *See*—
Bigbie, Samuel E.; Cavill, Barry R.; Dodgen, David F.; and Nawy, Albert A., 4,490,796, Cl. 364-519.000.

Dodson, William C., Jr., to Du Pont de Nemours, E. I., and Company. Air flow control apparatus for a fiber air-lay machine. 4,489,462, Cl. 19-306.000.

Doi, Akiho; and Saneyoshi, Norio, to Iwasaki Tsushinki Kabushiki Kaisha. Reception system for key telephone system. 4,490,820, Cl. 370-100.000.

Dolan, Bruce I.: *See*—
Read, Clifford D.; Dolan, Bruce I.; and McDonald, Paul D., 4,490,604, Cl. 235-146.000.

Dolby, Ray M. Compressor-expander circuits and, circuit arrangements for modifying dynamic range, for suppressing mid-frequency modulation effects and for reducing media overload. 4,490,691, Cl. 333-14.000.

Dolizy, Pierre; and Groliere, Francoise, to U.S. Philips Corporation. Photoelectric detection structure. 4,490,605, Cl. 250-213.0VT.

Donahue, Kenneth R.: *See*—
Struttmann, Hilarious S.; Donahue, Kenneth R.; and Cooper, Paul W., 4,489,475, Cl. 29-526.00R.

Donald, David K.: *See*—
Vaught, John L.; Cloutier, Frank L.; Donald, David K.; Meyer, John D.; Tacklind, Christopher A.; and Taub, Howard H., 4,490,728, Cl. 346-1.100.

Donlan, Jeffrey P.: *See*—
Gupta, Arunava; West, Gary A.; and Donlan, Jeffrey P., 4,490,192, Cl. 148-188.000.

Donnelly Mirrors, Inc.: *See*—
Bitter, Lowell E., 4,490,227, Cl. 204-192.0SP.

Donoghue, William J.: *See*—
Noufer, Glenn E.; and Donoghue, William J., 4,490,633, Cl. 307-475.000.

Doria, Gianfederico; Passarotti, Carlo; and Arcari, Giuliana, to Farmitalia Carlo Erba S.p.A. Substituted ethenyl derivatives of 1H-pyrazolo-[1,5-a]pyrimidine having gastroenteric activity, compositions thereof, and methods of using the same. 4,490,376, Cl. 424-251.000.

Dorn, Conrad P., Jr.: *See*—
Dean, Richard T.; Dorn, Conrad P., Jr.; and Shen, Tsung-Ying, 4,490,303, Cl. 260-453.990.

Dost, Martin H.; Liu, Chung C.; and Mueller, Francis E., to International Business Machines Corporation. Servo encodement and detection system using tetra-orthogonal servo pattern. 4,490,756, Cl. 360-77.000.

Dote, Yasuhiko: *See*—
Watabe, Tomiji; Kondo, Hideo; Matsuda, Toshihiko; Yano, Kenji; Dote, Yasuhiko; and Takagi, Matao, 4,490,621, Cl. 290-42.000.

Douty, George H.: *See*—
Asick, John C.; Douty, George H.; Goodman, Joseph R.; Jones, Kermit M., Jr.; Landis, John M.; Snyder, Clair W., Jr.; Woratyla, John A.; and Zell, Dale R., 4,489,998, Cl. 339-17.0LM.

Dow Chemical Company, The: *See*—
Gurgiolo, Arthur E.; and Knobel, Thomas M., 4,489,913, Cl. 521-53.000.

Redemann, Carl T., 4,490,380, Cl. 424-263.000.
Stauffer, Randall C.; and Pasztor, Andrew J., 4,490,262, Cl. 252-8.55R.
Dow Corning Limited: *See*—
Cash, Roger J., 4,490,488, Cl. 521-88.000.
Westall, Stephen; and White, James W., 4,490,416, Cl. 427-387.000.
Dragoco Gerberding & Co. GmbH: *See*—
Brunke, Ernst-Joachim; and Klein, Erich, 4,490,284, Cl. 252-522.00R.
Drake, Charles A., to Phillips Petroleum Company. Catalyst and process for dehydrating 2-alcohols. 4,490,567, Cl. 585-324.000.
Draper Corporation: *See*—
Wazenegger, Donald R., 4,489,762, Cl. 139-303.000.
Dravo Corporation: *See*—
Jaquay, Louis H.; and Mengon, Albert C., deceased, 4,490,237, Cl. 208-11.00R.
Drommert, Heinz: *See*—
Lucht, Hartmut; Wendt, Rainer; and Drommert, Heinz, 4,490,040, Cl. 356-318.000.
Drozd, Edward J., Jr., to Captive Plastics, Inc. Tamper-evident closure and container. 4,489,843, Cl. 215-252.000.
Dryman, William K.: *See*—
Collins, Byron R.; and Dryman, William K., 4,490,778, Cl. 362-267.000.
Du Pont Canada Inc.: *See*—
Mollison, Alistair N., 4,490,324, Cl. 264-211.000.
Duboz, George: *See*—
Bruni, Maurice; and Duboz, George, 4,490,152, Cl. 44-50.000.
Dubson, Philip. Adjustable apparatus. 4,489,826, Cl. 198-812.000.
Ducharme, Jacques. Joint for modular frame construction. 4,490,064, Cl. 403-255.000.
Duda, Werner, to Irwin Measuring Tool Company. Tape locking device. 4,489,494, Cl. 33-138.000.
Dugan, Richard F.: *See*—
Brown, Lynnie B.; Ford, Charles J., III; and Dugan, Richard F., 4,490,661, Cl. 318-661.000.
Duhon, Gus A. Wellhead lubricator. 4,489,780, Cl. 166-70.000.
Duke University: *See*—
Antonik, Steven J., 4,490,360, Cl. 424-95.000.
Dumas, Louis H.: *See*—
Patton, John T., Jr.; Narayan, Thirumurti; and Dumas, Louis H., 4,490,490, Cl. 521-177.000.
Dumbco Inc.: *See*—
Upchurch, Otha D.; and Bosley, Marvin F., 4,490,070, Cl. 404-121.000.
Dumont, Alain D. G.; and Fouret, Rene , to La Telemecanique Electrique. Detachable device for locking a contactor in its "on" position. 4,490,702, Cl. 335-169.000.
Dumont, Francois, to U.S. Philips Corporation. Device and method of positioning optical fibers. 4,490,202, Cl. 156-166.000.
Duncan, Norman P. F.; and Sexton, James E., to Mallinckrodt, Inc. Spoonable tomato product and method of making the same. 4,490,400, Cl. 426-335.000.
Dunning, Frederick G., to Allied Corporation. Method and apparatus for splicing polymeric webs. 4,490,199, Cl. 156-73.400.
Du Pont de Nemours, E. I., and Company: *See*—
Bissot, Thomas C.; and Grigsby, William E., 4,490,484, Cl. 521-27.000.
Dodson, William C., Jr., 4,489,462, Cl. 19-306.000.
Gelblum, Peter G., 4,490,347, Cl. 423-521.000.
Huybrechts, Jozef T., 4,490,499, Cl. 524-376.000.
Levy, Stanley B., 4,490,421, Cl. 428-35.000.
Priester, Thomas M.; and Rayner, Dennis R., 4,490,390, Cl. 424-298.000.
Vasta, Joseph A., 4,490,501, Cl. 524-413.000.
DuPont, John G.; and Goodwin, Paul A., to High Voltage Engineering Corporation. Radiation cured silicone rubber articles. 4,490,314, Cl. 264-22.000.
Duracell Inc.: *See*—
Moses, Peter R.; and Bowden, William L., 4,490,449, Cl. 429-196.000.
Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., to Smith Kline & French Laboratories Limited. Pharmaceutical compositions. 4,490,387, Cl. 424-274.000.
Dushane, Ray: *See*—
Mullich, Richard O.; and Dushane, Ray, 4,489,576, Cl. 70-134.000.
Dydelzak, Alexandr E.: *See*—
Volyneta, Filipp K.; Demidenko, Vladimir A.; Denisov, Roman A.; Denx, Viktor P.; Dydelzak, Alexandr E.; Ryzhikov, Engels N.; and Terentieva, Evgenia A., 4,490,286, Cl. 252-583.000.
Dyment, John C.: *See*—
Chik, Kiu-Chi D.; Devenyi, Tibor F.; and Dyment, John C., 4,489,477, Cl. 29-569.00L.
Dynamit Nobel AG: *See*—
Amort, Jurgen; Hanisch, Horst; Klapdor, Ute; Suerken, Hans P.; and van der Maas, Hendrikus, 4,490,526, Cl. 536-102.000.
Feld, Marcel; and Zoche, Gunter, 4,490,297, Cl. 260-429.00R.
Feld, Marcel, 4,490,298, Cl. 260-429.00R.
Glembin, Dirk; Kappler, Fritz-Robert; Curatolo, Luigi; and Trapani, Vittorio, 4,490,343, Cl. 423-336.000.
Dynapol: *See*—
Dawson, Daniel J.; and Otteson, Kenneth M., 4,490,557, Cl. 564-159.000.
Dziak, William A. Wear collar device for rotatable cutter bit. 4,489,986, Cl. 299-86.000.
E. B. Eddy Forest Products, Ltd.: *See*—
Gladish, Herbert E., 4,489,825, Cl. 198-811.000.
E. R. Squibb & Sons, Inc.: *See*—
Campbell, Randolph E., 4,490,145, Cl. 604-333.000.
E Systems, Inc.: *See*—
Poston, Billy R.; and Atkinson, Stuart L., 4,490,831, Cl. 375-94.000.
Eagle Industry Co., Ltd.: *See*—
Ohtsuka, Junji, 4,489,952, Cl. 277-96.200.
Eagle-Picher Industries, Inc.: *See*—
Beebe, James C.; and Cargould, Barry D., 4,489,598, Cl. 73-146.000.
Earing, James F., Jr. Pickup truck with interchangeable bed components. 4,489,977, Cl. 296-35.300.
Easley, Thomas E. Selectively operable doorstop for converting a double-acting door to a single-acting door. 4,489,968, Cl. 292-340.000.
Eastman Kodak Company: *See*—
Anagnostopoulos, Constantine N., 4,490,036, Cl. 356-1.000.
Anagnostopoulos, Constantine N.; and Frank, Lee F., 4,490,037, Cl. 356-1.000.
Baughman, Richard C.; and Bump, David S., 4,489,856, Cl. 222-148.000.
Feasey, Raymond D., 4,490,456, Cl. 430-210.000.
Frank, Lee F.; and Lee, James K., 4,490,027, Cl. 354-21.000.
Gilbert, David P., 4,490,463, Cl. 430-581.000.
House, Gary L., 4,490,458, Cl. 430-503.000.
Eaton Corporation: *See*—
Godbout, James L., 4,490,694, Cl. 333-104.000.
Hansen, James E., 4,490,620, Cl. 290-38.00R.
Hansen, James E., 4,490,659, Cl. 318-484.000.
Smith, Stanley K., 4,489,617, Cl. 73-862.190.
Ebara Corporation: *See*—
Kataoka, Tadashi; and Hiyama, Hirokuni, 4,489,951, Cl. 277-83.000.
Eberlein, Wolfgang: *See*—
Reiffen, Manfred; Heider, Joachim; Hauel, Norbert; Austel, Volkhard; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Noll, Klaus; Pieper, Helmut; Kruger, Gerd; and Keck, Johannes, 4,490,369, Cl. 424-244.000.
Echols, John C.; and Staufenberg, Charles W., to Essex-Tec Corporation. Coupling circuit between high impedance piezoelectric signal source and utilizing circuit. 4,490,639, Cl. 310-319.000.
Eckert, Rudolf J. A., to Shell Oil Company. Preparation of a lubricating oil additive, an additive thus prepared and a lubricating oil containing this additive. 4,490,267, Cl. 252-56.00R.
Eckhardt, Sandor: *See*—
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Honty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos, 4,490,378, Cl. 424-262.000.
Edwards, Ivan L.; Macrander, Max S.; and Khan, Ashfaq R., to GTE Automatic Electric Labs Inc. Clock selection control circuit. 4,490,581, Cl. 179-18.0EE.
Edwards, Robert B., II: *See*—
Quinn, David G.; and Edwards, Robert B., II, 4,490,143, Cl. 604-270.000.
Edwards, Robert E.: *See*—
Towers, John E.; and Edwards, Robert E., 4,489,987, Cl. 299-86.000.
EFCO Manufacturing Company Pty. Ltd., The: *See*—
Luker, Graham J., 4,490,624, Cl. 307-66.000.
Egami, Tsuneyuki: *See*—
Kohama, Tokio; Huzino, Seizi; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,489,695, Cl. 123-481.000.
Eheim, Franz: *See*—
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,489,698, Cl. 123-502.000.
Eickmann, Karl. Rotor bush assembly in fluid machines. 4,489,641, Cl. 91-498.000.
Eidenschink, Rudolf; Romer, Michael; and Weber, Georg, to Merck Patent Gesellschaft mit beschrankter Haftung. Liquid-crystalline halogen compounds, process for their preparation, dielectrics containing these, and electro-optical display element. 4,490,305, Cl. 260-465.00F.
Eilingsfeld, Heinz; and Etzbach, Karl-Heinz, to BASF Aktiengesellschaft. 5(3)-Aminopyrazolo-3,4(4,5)-dicarboximide azo dyestuff intermediates. 4,490,541, Cl. 548-370.000.
Eirich, Hubert: *See*—
Diem, Winfried, 4,489,862, Cl. 222-263.000.
Eirich, Paul: *See*—
Diem, Winfried, 4,489,862, Cl. 222-263.000.
Eirich, Walter: *See*—
Diem, Winfried, 4,489,862, Cl. 222-263.000.
Eisai Co., Ltd.: *See*—
Kimura, Makoto, 4,490,359, Cl. 424-93.000.
Shionoya, Hiroshi; Takeuchi, Hitoshi; and Funatsu, Gunki, 4,490,362, Cl. 424-177.000.
Ejiri, Yoshihiro: *See*—
Naksi, Taiichiro; Furusawa, Kahei; Sato, Masanori; Niiro, Yasuhiko; Ejiri, Yoshihiro; and Nunokawa, Makoto, 4,490,009, Cl. 350-96.230.
Ekbladh, Fred V. G.; and Tillander, Hans, to Aktiebolaget Meteve. Trocar. 4,490,136, Cl. 604-22.000.
Elastogran Maschinenbau GmbH: *See*—
Schlueter, Klaus, 4,490,048, Cl. 366-134.000.

Eli Lilly and Company: *See—*
Cooper, Robin D. G.; Blaszczak, Larry C.; and Turner, Jan R., 4,490,370, Cl. 424-246.000.
Huizenga, John R.; and Reddix, Lloyd E., 4,490,139, Cl. 604-57.000.
Ellin, Roger E., to Royal Diversified Products. Form for ready-made necktie. 4,489,443, Cl. 2-153.000.
Elliott Turbomachinery Co., Inc.: *See—*
Stralicka, William A., 4,489,468, Cl. 29-156.80R.
Ellis, Billy H.; and Ellis, Randall. Aluminum shingle accessories. 4,489,532, Cl. 52-748.000.
Ellis, Randall: *See—*
Ellis, Billy H.; and Ellis, Randall, 4,489,532, Cl. 52-748.000.
Elsaesser, Kurt: *See—*
Baumgaertner, Armin; and Elsaesser, Kurt, 4,490,451, Cl. 430-57.000.
Elter, Claus: *See—*
Schoening, Josef; Schwiers, Hans-Georg; Elter, Claus; Stracke, Wilfried; and Kolodrey, Hans-Juergen, 4,490,328, Cl. 376-285.000.
Emanuel S. Kardon: *See—*
Coleman, Robert L.; and Schneider, Charles F., 4,490,131, Cl. 493-217.000.
Emerson Electric Co.: *See—*
Struttmann, Hilarious S.; Donahue, Kenneth R.; and Cooper, Paul W., 4,489,475, Cl. 29-526.00R.
Terpstra, Daniel A.; and Brundage, Richard, 4,489,909, Cl. 248-99.000.
Emhart Industries, Inc.: *See—*
Nebelung, Hermann H.; and Knoth, Werner-Dieter, 4,490,164, Cl. 65-263.000.
Voland, Elmo W., 4,490,589, Cl. 200-38.00R.
Emrich, Helmut: *See—*
Cappel, Bert; Difflipp, Kurt; Emrich, Helmut; Erbach, Horst; Feldt, Wolfgang; Neberle, Klaus; and Ochs, Heinrich, 4,489,653, Cl. 101-415.100.
Endo, Norio: *See—*
Kinoshita, Mitsutaka; Nakagami, Tatsuro; Murakami, Nobuaki; Endo, Norio; Tamura, Fumio; and Danno, Yoshiaki, 4,489,685, Cl. 123-198.00F.
Energy Conversion Devices, Inc.: *See—*
Moore, Diane E.; Reyes, Jaime M.; and Munteanu, Eugen, 4,489,742, Cl. 136-203.000.
Energy-Pak, Ltd.: *See—*
Latzke, Arno W., 4,489,711, Cl. 128-1.300.
Energy Research Corporation: *See—*
Maru, Hansraj C.; and Farooque, Mohammad, 4,490,442, Cl. 429-13.000.
Energy Sciences, Inc.: *See—*
Nablo, Sam, 4,490,409, Cl. 427-44.000.
Engelfried, Werner; and Muller, Gerhard, to Terrot Strickmaschinen GmbH. Circular knitting machine. 4,489,573, Cl. 66-8.000.
Engineering & Research Associates, Inc.: *See—*
Minney, Stephen C.; and Harmony, Daniel C., 4,490,598, Cl. 219-10.810.
Enke, Christie G.; Newcome, Bruce H.; and Holland, John F., to Research Corporation. High repetition rate transient recorder with automatic integration. 4,490,806, Cl. 364-734.000.
Enright, Michael G.: *See—*
Stevenson, Robert C.; Enright, Michael G.; and Nodwell, Bruce, 4,489,914, Cl. 251-147.000.
EPIC Research Corporation: *See—*
Anthony, Myron L., 4,490,213, Cl. 201-17.000.
Epperson, Charles N., to Invention Development Equity Associates, Inc. Two-way nesting container for liquids. 4,489,839, Cl. 215-10.000.
Epsom, Robert L.; and Gailus, Paul H., to Motorola, Inc. Adaptive quadrature combining apparatus. 4,490,684, Cl. 330-149.000.
Epstein, Paul; Ballas, John S., Jr.; Mandler, John J., Jr.; and Van Horn, Joseph M., to American Home Products Corporation. Apparatus and method for qualitatively selecting between signals representative of a physiological characteristic. 4,489,726, Cl. 128-630.000.
Equipements Automobiles Marchal: *See—*
Bodin, Claude; and Gouin, Alain, 4,490,228, Cl. 204-192.00R.
Erbach, Horst: *See—*
Cappel, Bert; Difflipp, Kurt; Emrich, Helmut; Erbach, Horst; Feldt, Wolfgang; Neberle, Klaus; and Ochs, Heinrich, 4,489,653, Cl. 101-415.100.
Erickson, Erick E.; and Langlois, Daniel A. Illusion creating visual display device. 4,490,745, Cl. 358-250.000.
Erno Raumfahrttechnik GmbH/MBB: *See—*
Netter, Gaston; and Widjaja, Injas, 4,489,745, Cl. 137-209.000.
Ernst, Horst M.: *See—*
Brandenstein, Manfred; Ernst, Horst M.; Walter, Lothar; and Kaschube, Karl-Friedrich, 4,489,992, Cl. 384-496.000.
Escher Wyss GmbH: *See—*
Kurtz, Rudiger, 4,490,212, Cl. 162-298.000.
Espada Anstalt: *See—*
Tromeur, Jean-Francois, 4,490,122, Cl. 445-7.000.
Essex-Tec Corporation: *See—*
Echols, John C.; and Staufenberg, Charles W., 4,490,639, Cl. 310-319.000.
Essigmann, Martin L.: *See—*
Devona, James E.; and Essigmann, Martin L., 4,490,491, Cl. 523-318.000.
Esso Resources Canada Limited: *See—*
Stipdonk, Gustaaf, 4,489,828, Cl. 198-847.000.
Estabrook, Lawrence E.: *See—*
Quintana, Manuel E.; and Estabrook, Lawrence E., 4,490,251, Cl. 210-209.000.
Ethicon, Inc.: *See—*
Beroff, Howard; Thompson, Darrell R.; Mericle, Robert W.; and Travis, William C., Jr., 4,490,326, Cl. 264-328.160.
Ethyl Corporation: *See—*
Pendery, John J., 4,490,564, Cl. 568-730.000.
Walter, Thomas J., 4,490,535, Cl. 546-346.000.
Etzbach, Karl-Heinz: *See—*
Eilingsfeld, Heinz; and Etzbach, Karl-Heinz, 4,490,541, Cl. 548-370.000.
European Electronic Systems Limited: *See—*
Loose, Peter W., 4,490,617, Cl. 250-560.000.
Evans, Christopher J.: *See—*
Barchas, Jack D.; Weber, Eckard; and Evans, Christopher J., 4,490,363, Cl. 424-177.000.
Everest & Jennings, Inc.: *See—*
Friedrich, Paul H., 4,489,980, Cl. 297-411.000.
Goletski, Bert J., 4,489,981, Cl. 297-411.000.
Everett, Chauncey L.; Houston, Theodore W.; and Darley, Henry M., to Texas Instruments Incorporated. Noninverting amplifier circuit for one propagation delay complex logic gates. 4,490,632, Cl. 307-475.000.
Evrard, Paul; Lahille, Michel; and Avenel, Michel, to Altulor S.A.; and C.L.L. S.A.R.L. Compositions for surgical cement, based on at least one acrylic monomer and at least one acrylic polymer. 4,490,497, Cl. 524-349.000.
Exel Oy: *See—*
Aho, Yrjo , 4,490,063, Cl. 403-109.000.
Extracorporeal Medical Specialties, Inc.: *See—*
Troutner, Vernon H., 4,490,134, Cl. 604-5.000.
Troutner, Vernon H., 4,490,135, Cl. 604-5.000.
Exxon Research and Engineering Co.: *See—*
Comeaux, Roy V.; Leighton, Milton D.; and Ryan, Douglas G., 4,490,240, Cl. 208-47.000.
Humphries, Michael J.; and Schumacher, Edward B., 4,490,333, Cl. 422-241.000.
Peterson, John R., 4,490,334, Cl. 422-241.000.
Siskin, Michael, 4,490,238, Cl. 208-11.0LE.
F. F. Seeley Nominees Pty. Ltd.: *See—*
McBratney, Peter, 4,490,636, Cl. 310-71.000.
F. L. Smidth & Co. A/S: *See—*
Petersen, Luis, 4,489,895, Cl. 241-19.000.
Fabiny, William J.: *See—*
Mosser, Mark F.; McMordie, Bruce G.; and Fabiny, William J., 4,489,670, Cl. 118-55.000.
FAG Kugelfischer Georg Schafer & Co.: *See—*
Schuster, Friedrich; and Weigert, Hans, 4,489,546, Cl. 57-340.000.
Weiss, Siegfried; Heurich, Gunther; and Kotzab, Werner, 4,490,128, Cl. 474-166.000.
Fahim, Atef E. F.; Lee, Rock S. Y.; and Cheng, Richard M. H. Hammer drill adapter. 4,489,792, Cl. 173-48.000.
Fahrbach, Erich: *See—*
Knoke, Jurgen; Jost, Manfred; Tecl, Bohuslav; and Fahrbach, Erich, 4,490,425, Cl. 428-90.000.
Failor, Raymond A.; and Kabdebo, Otto Z., to Simmons Universal Corporation. Trauma care wheeled stretcher. 4,489,449, Cl. 5-86.000.
Fairchild Camera & Instrument Corp.: *See—*
Keyser, Thomas; Thomas, Michael E.; Pierce, John M.; and Cleeves, James M., 4,489,482, Cl. 29-591.000.
Pierce, John M.; and Lehrer, William I., 4,490,737, Cl. 357-73.0JJ.
Falk, Robert A., to Ciba-Geigy Corporation. Perfluoroalkyl thioalkylene amphoteric compounds. 4,490,304, Cl. 260-457.000.
Falzone, Joseph S. Anti-smog means. 4,489,703, Cl. 123-568.000.
Familant, Harold M.: *See—*
Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,489,543, Cl. 57-208.000.
Farmitalia Carlo Erba S.p.A: *See—*
Doria, Gianfederico; Passarotti, Carlo; and Arcari, Giuliana, 4,490,376, Cl. 424-251.000.
Farooque, Mohammad: *See—*
Maru, Hansraj C.; and Farooque, Mohammad, 4,490,442, Cl. 429-13.000.
Faupel, Werner: *See—*
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,489,698, Cl. 123-502.000.
Faure, Jean-Louis; and Venot, Jean, to ASA S.A. Process and device for obtaining a spun yarn of fibres comprising an internal core and novel types of spun yarns thus made. 4,489,540, Cl. 57-5.000.
Fawcett, Sherwood L.; and Anno, James N., to Battelle Development Corporation. Turbocharger for internal combustion engines. 4,489,557, Cl. 60-605.000.
Fawcett, Sherwood L.; and Anno, James N., to Battelle Development Corporation. Compound internal combustion engine and method for its use. 4,489,558, Cl. 60-605.000.
Fawcett, Sherwood L.; and Anno, James N., to Battelle Development Corporation. Turbocharger for internal combustion engines. 4,489,559, Cl. 60-605.000.
Fawcett, Sherwood L.; and Anno, James N., to Battelle Development Corporation. Compound internal combustion engine and method for its use. 4,489,560, Cl. 60-605.000.
Feasey, Raymond D., to Eastman Kodak Company. Self-developing photographic film units. 4,490,456, Cl. 430-210.000.

Fechner, Wolf D.; Kranz, Joachim; and Polster, Rudolf, to BASF Aktiengesellschaft. Fluid, stable formulations. 4,490,176, Cl. 106-23.000.
Feder, Darryl. Apparatus for and method of metalizing internal surfaces of metal bodies such as tubes and pipes. 4,490,411, Cl. 427-46.000.
Fekete, Gyorgy: *See*—
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Hosty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos. 4,490,378, Cl. 424-262.000.
Feld, Marcel; and Zoche, Gunter, to Dynamit Nobel AG. Method for the recovery and reuse of cobalt and/or manganese components of catalysts. 4,490,297, Cl. 260-429.00R.
Feld, Marcel, to Dynamit Nobel AG. Method of isolating cobalt and/or manganese as oxalates. 4,490,298, Cl. 260-429.00R.
Feldman, Alan S., to Sperry Corporation. Bi-directional driver system for electrical load. 4,490,655, Cl. 318-294.000.
Feldt, Wolfgang: *See*—
Cappel, Bert; Difflipp, Kurt; Emrich, Helmut; Erbach, Horst; Feldt, Wolfgang; Neberle, Klaus; and Ochs, Heinrich, 4,489,653, Cl. 101-415.100.
Fellas, Christakis N., to British Aerospace Public Limited Company. Thermal control material. 4,489,906, Cl. 244-158.00A.
Ferag AG: *See*—
Meier, Jacques, 4,489,930, Cl. 270-55.000.
Ferdinando, Medea: *See*—
D'Andrea, Nicola; D'Andrea, Ermanno; Adriano, Castellini; and Ferdinando, Medea, 4,489,629, Cl. 82-1.200.
Ferguson, Joseph D. Mounting bracket for traffic signal installation. 4,489,910, Cl. 248-219.400.
Fernandes, John H., to Combustion Engineering, Inc. Indirectly heated fluidized bed gasifier. 4,490,157, Cl. 48-62.00R.
Ferraro, Rick J.; and Lynch, Henry W., to Medical Engineering Corporation. Laser resistant endotracheal tube. 4,489,722, Cl. 128-207.150.
Ferrero, Aldo; and Ferrero, Mauro. Process for obtaining light and crispy soybean proteins of agreeable taste and product thus obtained. 4,490,406, Cl. 426-634.000.
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Ferrero, Aldo; and Ferrero, Mauro, 4,490,406, Cl. 426-634.000.
Ferris, Loren B. Power recovery system and method for elevator apparatus. 4,489,812, Cl. 187-29.00R.
Ferrofluidics Corporation: *See*—
Chorney, Alvan F., 4,489,950, Cl. 277-80.000.
Fesko, Donald G., to Ford Motor Company. Spring leaf comprising pultruded beam. 4,489,922, Cl. 267-149.000.
Field, Thomas T.: *See*—
Sines, Roger B.; Field, Thomas T.; and Papineau, Patrick F., 4,490,186, Cl. 148-11.50N.
Fields, Bernard N.: *See*—
Greene, Mark I.; and Fields, Bernard N., 4,490,358, Cl. 424-86.000.
Fields, Ellis K.: *See*—
Winzenburg, Mark L.; Fields, Ellis K.; and Shneider, Benjamin L., 4,490,545, Cl. 549-234.000.
Filimonova, Ljudmila Y.: *See*—
Maslyaev, Viktor S.; Sagalovsky, Evgeny S.; Khudosovtseva, Galina P.; Goroveis, Petr M.; Filimonova, Ljudmila Y.; and Zborschik, Ljubov A., 4,490,274, Cl. 252-186.220.
Filippov, Gennady A.: *See*—
Shamarokov, Alexandr S.; Kuzmin, Alexei V.; Glebov, Vladimir P.; Moskvichev, Viktor F.; Morozova, Nadezhda A.; Filippov, Gennady A.; Tarankov, Gennady A.; Lukasevich, Boris I.; Andreev, Leonid M.; and Grishakov, Viktor I., 4,489,788, Cl. 122-32.000.
Filippov, Jury M.; and Rochkarev, Gely R. Method and flotation machine for concentrating ores of non-ferrous metals. 4,490,248, Cl. 209-164.000.
Filshie, Gilbert M.: *See*—
Casey, Donn; and Filshie, Gilbert M., 4,489,725, Cl. 128-346.000.
Finch, Dale E.: *See*—
Carr, Travis C.; and Finch, Dale E., 4,490,140, Cl. 604-65.000.
Findlay, Hugh T.; and Rood, Leonard M., to International Business Machines Corporation. Self-supporting thermal ink. 4,490,430, Cl. 428-217.000.
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Weber, Klaus; Gerber, Siegfried; and Fischer, Horst, 4,490,025, Cl. 350-529.000.
Fischer, Karl; and Schreder, Felix, to Fischer, Karl. Electric hotplate with a mounting ring around it. 4,490,603, Cl. 219-463.000.
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Canalizo, Carlos R.; and Fisher, Ernest P., Jr., 4,489,743, Cl. 137-155.000.
Fisher, Milton W.; and Henson, Glen E., to Fisher, Milton W. Exercise device. 4,489,933, Cl. 272-65.000.
Fitzgerald, Patrick W. Foldable tables and the like. 4,489,661, Cl. 108-113.000.
Fiziko-Tekhnichesky Institut Akademi Nauk Belorusskoi SSR: *See*—
Davidovich, Alexandr N.; Schukin, Valery Y.; Klushin, Valery A.; Sadko, Vladimir I.; Skrebets, Nikolai M.; and Murashko, Evgeny T., 4,489,581, Cl. 72-70.000.
Flaherty, B. Michael. Vehicle body. 4,489,976, Cl. 296-185.000.
Flaig, Hans; Rapp, Egon; Brede, Herrmann; and Ganter, Wolfgang, to Gebruder Junghans GmbH. Electromechanical short interval timer. 4,490,051, Cl. 368-109.000.
Flakt Aktiebolag: *See*—
Matts, Sigvard, 4,490,159, Cl. 55-2.000.
Flanigen, Edith M.: *See*—
Garska, Daniel C.; and Flanigen, Edith M., 4,490,568, Cl. 585-415.000.
Fleetwood Enterprises, Inc.: *See*—
Kliewer, Aron, 4,490,317, Cl. 264-46.500.
Fleming, Ian D.; Noble, David; Noble, Hazel M.; and Wall, Wilfred F., to Beecham Group p.l.c. Pure salts of clavulanic acid, e.g. lithium clavulanate. 4,490,294, Cl. 260-245.300.
Fleming, Ian D.; Noble, David; Noble (formerly Gillett), Hazel M.; and Wall, Wilfred F., to Beecham Group p.l.c. Pure sodium salt of clavulanic acid. 4,490,295, Cl. 260-245.300.
Fletcher, Ivan M., to AT&T Technologies, Inc. Electroplating apparatus. 4,490,230, Cl. 204-228.000.
Flickinger, Michael C.: *See*—
Gong, Cheng Shung; Chen, Li Fu; Flickinger, Michael C.; and Tsao, George T., 4,490,468, Cl. 435-161.000.
Flider, Frank S., to Justrite Manufacturing Company. Safety can conversion apparatus. 4,489,860, Cl. 222-189.000.
Flint, John E. Composition for shock treatment. 4,490,391, Cl. 424-317.000.
Fluetsch, Ellis E. Lockable apparatus for deactivating a hydraulic system. 4,489,748, Cl. 137-384.400.
FMC Corporation: *See*—
Cozad, Harley R., 4,489,838, Cl. 212-264.000.
Witt, Robert L., 4,489,953, Cl. 277-188.00A.
Fong, Dodd W.; and Kowalski, David J., to Nalco Chemical Company. New water-soluble sulfonated monomers. 4,490,308, Cl. 260-513.00N.
Forcht, Brennan A.; and Thomas, Gerald F., to LTV Aerospace and Defense Co. Corrosion resistant thermal control material and process. 4,490,184, Cl. 148-6.210.
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Brown, Lynnie B.; Ford, Charles J., III; and Dugan, Richard F., 4,490,661, Cl. 318-661.000.
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Fesko, Donald G., 4,489,922, Cl. 267-149.000.
Rhee, Dennis W., 4,490,683, Cl. 330-51.000.
Formanek, Lothar; Hirsch, Martin; Schnabel, Wolfram; Serbent, Harry; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Arlt, Detmar, to Metallgesellschaft AG; and Mannesmann AG. Process of making steel by melting sponge iron in an electric arc furnace. 4,490,168, Cl. 75-10.00R.
Forsberg, Lennart G. K.; and Moberg, Per-Ingvar. Air stream separator. 4,490,247, Cl. 209-20.000.
Forward, Cleve H.; Butler, James R.; Watson, James M.; and Branum, Gary D., to Cosden Technology, Inc. Method for para selective alkylation employing silicalite catalysts. 4,490,570, Cl. 585-467.000.
Foucher, Walter D., Jr.: *See*—
Sung, Rodney L.; Yeakey, Ernest L.; Foucher, Walter D., Jr.; and Cuscurida, Michael, 4,490,154, Cl. 44-70.000.
Fouret, Rene : *See*—
Dumont, Alain D. G.; and Fouret, Rene , 4,490,702, Cl. 335-169.000.
Fowler, Orren V., to United States of America, Air Force. Releasable cable connector assembly for use between a mobile and stationary object. 4,490,002, Cl. 339-45.00M.
Fowler, Wilbur P.: *See*—
Mitchell, Larry L., 4,490,198, Cl. 156-71.000.
Fralish, Mark R., to J. I. Case Company. Sweeper and turf thatcher. 4,489,539, Cl. 56-400.020.
Franckx, Joris R. L., to N. V. Raychem S.A. Fin-shaped conductive member for branch-off system. 4,490,426, Cl. 428-99.000.
Frank, Lee F.; and Lee, James K., to Eastman Kodak Company. Magnetically encoded film containers and camera adjusting mechanisms. 4,490,027, Cl. 354-21.000.
Frank, Lee F.: *See*—
Anagnostopoulos, Constantine N.; and Frank, Lee F., 4,490,037, Cl. 356-1.000.
Franke, Rudiger; and Weiss, Aby, to Mannesmann AG. Cross-pit conveyor. 4,489,818, Cl. 198-311.000.
Franks, James A.; Martin, Richard R.; and Walsh, Richard F., to Art Systems, Inc. Fuel dispensing and vehicle maintenance system. 4,490,798, Cl. 364-550.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Jose; and Riessberger, Klaus, 4,490,038, Cl. 356-5.000.
Fredin, Sture, to Thycho Fredin AB. Support apparatus for a raised side panel of a truck or trailer. 4,489,975, Cl. 296-181.000.
Freeman, Leo B., to International Business Machines Corporation. Current switch emitter follower with current mirror coupled push-pull output stage. 4,490,630, Cl. 307-455.000.
Frenkel, Mark I. Straightway valve. 4,489,753, Cl. 137-512.150.
Frentzel, Richard L., to Celotex Corporation, The. Metal catalyzed preparation of polyoxyalkylene surfactants for phenolic foam stabilization. 4,490,489, Cl. 521-136.000.
Fresch, Henry D.: *See*—
Brown, Paul R.; and Fresch, Henry D., 4,489,474, Cl. 29-508.000.
Freudenschuss, Otto; Morell, Josef; Rollenitz, Leopold; and Schmidt, Harald, to Steyr-Daimler-Puch Aktiengesellschaft. Fuel-injecting piston pump for diesel engines. 4,490,098, Cl. 417-499.000.
Friedrich, Paul H., to Everest & Jennings, Inc. Adjustable arm rest trigger handle. 4,489,980, Cl. 297-411.000.
Friedrichs, Louis G., Jr.: *See*—
Becker, Kenneth W.; Friedrichs, Louis G., Jr.; Kropp, Lev; and Straka, Richard B., 4,490,401, Cl. 426-407.000.
Frissora, Anthony P., to Allied Corporation. Multi-axes centering fixture. 4,489,499, Cl. 33-181.00R.

Fritzsche, Klaus-Dietrich: *See*—
Formanek, Lothar; Hirsch, Martin; Schnabel, Wolfram; Serbent, Harry; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Arlt, Detmar, 4,490,168, Cl. 75-10.00R.
Fugitt, Jock A.: *See*—
Lancaster, Henry D.; Fugitt, Jock A.; and Howard, Donald R., 4,490,648, Cl. 315-5.410.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Matsuzaki, Takeshi, 4,489,693, Cl. 123-440.000.
Fuji Photo Film Co., Ltd.: *See*—
Akashi, Goro; and Ueno, Wataru, 4,490,762, Cl. 360-128.000.
Maekawa, Masakazu; and Ogata, Yasuhiro, 4,490,732, Cl. 346-200.000.
Yoshida, Toru, 4,490,418, Cl. 427-445.000.
Fuji Xerox Co., Ltd.: *See*—
Imai, Hidekazu, 4,490,034, Cl. 355-57.000.
Moriguchi, Fujio, 4,490,664, Cl. 318-696.000.
Moriguchi, Fujio, 4,490,740, Cl. 358-75.000.
Moriguchi, Haruhiko, 4,490,746, Cl. 358-286.000.
Sekimoto, Souichi; and Kato, Ryoki, 4,490,611, Cl. 250-316.100.
Fujii, Isao: *See*—
Yagi, Shizuo; Fujii, Isao; and Ajiki, Yoshio, 4,489,686, Cl. 123-260.000.
Fujii, Setsuro; and Sakakibara, Eiichi, to Funai Pharmaceutical Ind., Ltd. 2'-Deuxy-5-fluorouridine derivative and a process for producing the same and an antitumor agent comprising the same. 4,490,366, Cl. 424-180.000.
Fujii, Setsuro; Aoyama, Takuo; Sakurai, Yojiro; Nakayama, Toyoo; Nunomura, Shigeki; Yaegashi, Takashi; and Okutome, Toshiyuki, to Torii & Co., Ltd. Amidine compound and anticomplement agent comprising same. 4,490,388, Cl. 424-278.000.
Fujii, Shigeru: *See*—
Fukuhara, Mototada; Ono, Keizo; Morita, Ken-ichi; and Fujii, Shigeru, 4,490,828, Cl. 373-117.000.
Fujikawa, Kanichi; Tsujii, Yasuhiro; Shigehara, Itaru; Isogai, Tatsuo; Yoshizawa, Hiroshi; and Miyaji, Mikio, to Ishihara Sangyo Kaisha Ltd. Process for producing 3-chloro-5-trifluoromethylpyridines. 4,490,534, Cl. 546-345.000.
Fujikawa, Tetsuzo; Hirata, Makizo; and Tamba, Shinichi, to Kawasaki Jukogyo Kabushiki Kaisha. Integrated fuel control system for gasoline engine. 4,490,309, Cl. 261-52.000.
Fujimatsu, Wataru: *See*—
Iijima, Toshifumi; Onodera, Kaoru; and Fujimatsu, Wataru, 4,490,459, Cl. 430-505.000.
Fujino, Masahiko, to Takeda Chemical Industries, Ltd. Nonapeptide amides. 4,490,291, Cl. 260-112.5LH.
Fujisawa, Fumio: *See*—
Shiohata, Kouki; Fujisawa, Fumio; Watanabe, Takashi; and Ishibashi, Yasumasa, 4,489,606, Cl. 73-462.000.
Fujishima, Teruyoshi: *See*—
Shindow, Kenji; Uenaka, Akimitsu; Izumo, Takaharu; Fujishima, Teruyoshi; and Yamamoto, Satoshi, 4,490,417, Cl. 427-388.300.
Fujitsu Fanuc Limited: *See*—
Inaba, Hajimu; and Torii, Nobutoshi, 4,489,821, Cl. 198-472.000.
Kishi, Hajimu; Seki, Masaki; Tanaka, Kunio; and Takegahara, Takashi, 4,490,781, Cl. 364-191.000.
Fujitsu Limited: *See*—
Nakatani, Shoji, 4,490,786, Cl. 364-200.000.
Ohya, Masayuki; and Inou, Masaaki, 4,490,787, Cl. 364-200.000.
Sakurai, Junji, 4,489,478, Cl. 29-574.000.
Sano, Yoshiaki, 4,490,685, Cl. 330-252.000.
Ueda, Kohichi; Kamimoto, Shigemi; and Miyata, Akira, 4,490,809, Cl. 364-900.000.
Fujiu, Shosuke: *See*—
Ogura, Daisuke; and Fujiu, Shosuke, 4,490,132, Cl. 493-424.000.
Fujiwara, Masakatu: *See*—
Matsumoto, Hirofumi; Fujiwara, Masakatu; Tsuchida, Yasuyuki; and Miyazaki, Yoshifumi, 4,490,127, Cl. 474-110.000.
Fujiwara, Tatsuro; Watanabe, Hideyuki; Hirano, Takao; and Sakakibara, Hideo, to Toyo Jozo Kabushiki Kaisha. 23-O-Acyl-23-demycinosyldesmycosin derivatives. 4,490,524, Cl. 536-7.100.
Fukami, Akira; and Okamoto, Kunio, to Nippon Soken, Inc. Moisture sensitive element. 4,489,603, Cl. 73-337.000.
Fukaya, Toshio: *See*—
Yotuyanagi, Masahiko; and Fukaya, Toshio, 4,490,412, Cl. 427-122.000.
Fukuchi, Kiyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Rear suspension system for motorcycles. 4,489,803, Cl. 180-227.000.
Fukuda, Kumio: *See*—
Shimoma, Taketoshi; Fukuda, Kumio; and Shimaoogi, Toshio, 4,490,644, Cl. 313-413.000.
Fukuda, Tadaji: *See*—
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,490,453, Cl. 430-65.000.
Fukuhara, Mototada; Ono, Keizo; Morita, Ken-ichi; and Fujii, Shigeru, to Toray Industries, Inc. Electric resistance heating element and electric resistance heating furnace using the same as heat source. 4,490,828, Cl. 373-117.000.
Fukushima, Nobuo; Nakae, Kiyohiko; and Terazawa, Takayuki, to Sumitomo Chemical Company, Limited. Agricultural plastic film. 4,490,502, Cl. 524-445.000.
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Fujii, Setsuro; and Sakakibara, Eiichi, 4,490,366, Cl. 424-180.000.
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Shionoya, Hiroshi; Takeuchi, Hitoshi; and Funatsu, Gunki, 4,490,362, Cl. 424-177.000.
Fung, Anthony K.: *See*—
Plattner, Jacob J.; and Fung, Anthony K., 4,490,384, Cl. 424-272.000.
Funk, Richard L., to Hercules Incorporated. Low detonation velocity explosive composition. 4,490,196, Cl. 149-92.000.
Furr, Dale D., to Ceramic Cooling Tower Company. Cooling tower with interlocking tiles. 4,490,312, Cl. 261-98.000.
Furusawa, Kahei: *See*—
Nakai, Taiichiro; Furusawa, Kahei; Sato, Masanori; Niiro, Yasuhiko; Ejiri, Yoshihiro; and Nunokawa, Makoto, 4,490,009, Cl. 350-96.230.
Fuzesi, Stephen; and Brown, Robert W., to Olin Corporation. Solid TDI residue-dicarboxylic ester binder composition and lignocellulosic composite materials prepared therefrom. 4,490,517, Cl. 527-401.000.
Fuzesi, Stephen; and Brown, Robert W., to Olin Corporation. Liquid organic polyisocyanate-dicarboxylic ester binder composition and lignocellulosic composite materials prepared therefrom. 4,490,518, Cl. 527-401.000.
G. D Societa' per Azioni: *See*—
Seragnoli, Enzo; and Mattei, Riccardo, 4,489,631, Cl. 83-278.000.
Gage, Charles A.; Blair, Timothy T.; and Morgan, Thomas W., to Xerox Corporation. Reproducing apparatus with scrolled imaging web. 4,490,033, Cl. 355-16.000.
Gagnon, Pierre; and Laforest, Pierre. Clutch brake assembly. 4,489,817, Cl. 192-18.00A.
Gailus, Paul H.: *See*—
Epsom, Robert L.; and Gailus, Paul H., 4,490,684, Cl. 330-149.000.
Galian, Boris A.: *See*—
Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; and Galian, Boris A., 4,490,599, Cl. 219-61.100.
Gall, Owen M.; Thomson, Thomas L.; and Taylor, Robert S., to Hartup Tool, Inc. Single stroke, draw and trim die assembly. 4,489,584, Cl. 72-327.000.
Gallopo, Andrew R., to Warner-Lambert Company. Effervescent denture cleaning composition comprising monoperphthalate. 4,490,269, Cl. 252-94.000.
Gammill, Ronald B., to Upjohn Company, The. Antiatherosclerotic benzopyrans. 4,490,547, Cl. 549-387.000.
Ganellin, Charon R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., 4,490,387, Cl. 424-274.000.
Gani, Mohamed M.; May, Keith; and Porter, Philip, to Internationale Octrooi Maatschappij "Octropa" B.V. Process for the recovery of immunoglobulins. 4,490,290, Cl. 260-112.00B.
Ganter, Wolfgang: *See*—
Flaig, Hans; Rapp, Egon; Brede, Herrmann; and Ganter, Wolfgang, 4,490,051, Cl. 368-109.000.
Gantz, Jack L.: *See*—
Cholvin, Robert L.; McInerney, Charles E.; Nancarrow, James N.; and Gantz, Jack L., 4,489,702, Cl. 123-564.000.
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Kempel, John J., 4,489,459, Cl. 16-248.000.
Garrett Corporation, The: *See*—
Cholvin, Robert L.; McInerney, Charles E.; Nancarrow, James N.; and Gantz, Jack L., 4,489,702, Cl. 123-564.000.
Kasabian, George, 4,489,549, Cl. 60-39.020.
Garska, Daniel C.; and Flanigen, Edith M., to Union Carbide Corporation. Conversion of certain hydrocarbons using calcined TEA-silicate catalyst. 4,490,568, Cl. 585-415.000.
Gary, David A., to Russ, William A., a part interest. Angled rolling knives and method of weeding. 4,489,787, Cl. 172-1.000.
Gasparaitis, Bernard V.; Krieg, Larry M.; Schweet, Richard R.; Williams, William R.; and Burbank, Raymond W., to Motorola, Inc. Frequency determining apparatus for a synthesized radio. 4,490,813, Cl. 365-63.000.
Gates, William E.: *See*—
Pieters, Wim J.M.; and Gates, William E., 4,489,593, Cl. 73-38.000.
Gayler, Ronald: *See*—
Hardwick, William H.; and Gayler, Ronald, 4,490,287, Cl. 252-629.000.
Gebhard Balluff Fabrik GmbH & Co.: *See*—
Kroll, Peter, 4,489,467, Cl. 24-525.000.
Gebruder Junghans GmbH: *See*—
Flaig, Hans; Rapp, Egon; Brede, Herrmann; and Ganter, Wolfgang, 4,490,051, Cl. 368-109.000.
Gelblum, Peter G., to Du Pont de Nemours, E. I., and Company. Process for sulfuric acid regeneration. 4,490,347, Cl. 423-521.000.
General Binding Corporation: *See*—
Turner, Peter J.; and Morrissey, Neal J., 4,489,897, Cl. 241-167.000.
General Dynamics, Pomona Division: *See*—
Bastian, Thomas W.; and Schertz, Charles W., 4,489,638, Cl. 89-1.815.
General Electric Company: *See*—
Beall, Donald L.; and Tomlinson, Harold W., Jr., 4,490,848, Cl. 382-121.000.
Collins, Byron R.; and Dryman, William K., 4,490,778, Cl. 362-267.000.
Hale, Thomas E., 4,490,191, Cl. 148-31.500.
Lee, Minyoung; Borom, Marcus P.; and Szala, Lawrence E., 4,490,319, Cl. 264-65.000.
Levinson, Lionel M., 4,490,014, Cl. 350-334.000.
Mark, Victor, 4,490,504, Cl. 524-537.000.
Miller, Russell S., 4,489,773, Cl. 164-463.000.
Mullersman, Ferdinand H., 4,490,667, Cl. 320-48.000.

Olson, Daniel R.; and O'Donnell, Timothy W., 4,490,774, Cl. 361-311.000.
Smith, Robert A., 4,490,500, Cl. 524-378.000.
Thompson, Paige W.; and Kelly, Ronald W., 4,490,708, Cl. 337-320.000.
Wang, Hsin-Pang, 4,490,649, Cl. 315-50.000.
General Electrodynamics Corp.: *See*—
Menon, Narandranath, 4,489,799, Cl. 177-209.000.
Menon, Narendranath, 4,489,798, Cl. 177-209.000.
General Foods Inc.: *See*—
Maurice, Terrence J.; and Grealy, Jennifer M., 4,490,397, Cl. 426-276.000.
General Mining Union Corporation Limited: *See*—
Luck, Dieter G., 4,490,086, Cl. 414-376.000.
General Motors Corporation: *See*—
Anderson, Jeffrey A., 4,489,883, Cl. 236-92.00C.
Davison, Ellard D., Jr., 4,489,597, Cl. 73-118.000.
Klomp, Edward D.; and Rask, Rodney B., 4,489,595, Cl. 73-115.000.
Malarz, Antoni J.; and Wright, Dolph D., 4,489,758, Cl. 137-881.000.
Taylor, Philip E., 4,489,965, Cl. 292-34.000.
Tsai, Lung-Wen; and Johnson, Thomas J., 4,489,683, Cl. 123-192.00B.
Zyngier, John F., 4,489,979, Cl. 297-391.000.
General Signal Corporation: *See*—
Rattan, William D.; and Walwyn, Craig M., 4,489,740, Cl. 134-140.000.
Westveer, Robert C., 4,489,642, Cl. 91-499.000.
Geosource Inc.: *See*—
Lockett, James F.; Smither, Miles A.; and Janecka, Jerry F., 4,490,606, Cl. 250-227.000.
Gerace, Michael J., to Protective Treatments, Inc. Non-structural and structural hot-melt adhesive and sealant tapes. 4,490,424, Cl. 428-68.000.
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Delam, Heinz, 4,489,991, Cl. 384-428.000.
Gerber, Siegfried: *See*—
Weber, Klaus; Gerber, Siegfried; and Fischer, Horst, 4,490,025, Cl. 350-529.000.
Gerhart, Grant R.; and Graziano, James M., to United States of America, Army. Two-dimensional image data reducer and classifier. 4,490,851, Cl. 382-43.000.
Gerkema, Jan; and Miedema, Andries R., to U.S. Philips Corporation. Device incorporating a bearing. 4,490,264, Cl. 252-12.000.
Ghisalba, Oreste; Heinzer, Franz; and Kuenzi, Martin, to Ciba-Geigy Corporation. Microorganisms of the genus Pseudomonas and process for degrading compounds which contain methyl groups in aqueous solutions. 4,490,471, Cl. 435-253.000.
Gibbons, James F., to Sera Solar Corporation. Solar cells. 4,490,573, Cl. 136-255.000.
Gibbs, Sam G. Method for monitoring an oil well pumping unit. 4,490,094, Cl. 417-42.000.
Gidick, Ward F., to Raymond Kaiser Engineers Inc. Apparatus for extending a header. 4,489,747, Cl. 137-315.000.
Giesinger, Hans: *See*—
Buschor, Karl; Giesinger, Hans; and Moos, Kurt, 4,489,749, Cl. 137-487.500.
Gilbert, David P., to Eastman Kodak Company. Alkanediyl bridged benzimidazolo monomethine cyanine dyes, processes for their preparation, and photographic emulsions and elements containing such dyes. 4,490,463, Cl. 430-581.000.
Gilbertson, Thomas A. Hydraulic pump driving unit for oil wells. 4,490,097, Cl. 417-401.000.
Gillman, Donald O.: *See*—
Kops, Earl A., 4,489,605, Cl. 73-455.000.
Giordano, Richard R.: *See*—
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Heijnen, Joseph J.; Lourens, Pieter A.; Venema, Cornelis P.; and Vroemen, Albert J., 4,490,258, Cl. 210-617.000.
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Chertok, Allan; Gjertsen, John, Sr.; and Manfredi, Louis, 4,490,093, Cl. 416-26.000.
Gladish, Herbert E., to E. B. Eddy Forest Products, Ltd. Air film supported and guided load support member. 4,489,825, Cl. 198-811.000.
Glaenzer Spicer: *See*—
Orain, Michel A., 4,490,126, Cl. 464-111.000.
Glasser, Joseph. Drainage device. 4,490,072, Cl. 405-45.000.
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Sirch, Edgar; and Vicariesmann, Jurgen, 4,489,645, Cl. 98-36.000.
Glebov, Vladimir P.: *See*—
Shamarokov, Alexandr S.; Kuzmin, Alexei V.; Glebov, Vladimir P.; Moskvichev, Viktor F.; Morozova, Nadezhda A.; Filippov, Gennady A.; Tarankov, Gennady A.; Lukasevich, Boris I.; Andreev, Leonid M.; and Grishakov, Viktor I., 4,489,788, Cl. 122-32.000.
Glembin, Dirk; Kappler, Fritz-Robert; Curatolo, Luigi; and Trapani, Vittorio, to Dynamit Nobel AG. Method for the separation of chlorosilanes from a gaseous mixture containing hydrogen chloride and hydrogen. 4,490,343, Cl. 423-336.000.
Godbout, James L., to Eaton Corporation. Microwave switch wherein PIN diode is mounted orthogonal to microstrip substrate. 4,490,694, Cl. 333-104.000.
Godoshian, Vanig. Auto-dialing pager receiver. 4,490,579, Cl. 179-2.0EC.
Goedecke, Alfred. Wind motor machine. 4,490,623, Cl. 290-55.000.
Goel, Anil B., to Ashland Oil, Inc. Preparation of dibenzofuran. 4,490,550, Cl. 549-460.000.
Gogniat, Paul, to Montres Rado S.A. Watchcase. 4,490,052, Cl. 368-292.000.
Goletski, Bert J., to Everest & Jennings, Inc. Wheelchair adjustable arm rest assembly. 4,489,981, Cl. 297-411.000.
Gomann, Rolf; and Krause, Lothar, to Hauni-Werke Korber & Co. KG. Apparatus for filling trays with cigarettes or the like. 4,489,534, Cl. 53-151.000.
Gong, Cheng Shung; Chen, Li Fu; Flickinger, Michael C.; and Tsao, George T., to Purdue Research Foundation. Production of ethanol by yeast using xylulose. 4,490,468, Cl. 435-161.000.
Goodman, Joseph R.: *See*—
Asick, John C.; Douty, George H.; Goodman, Joseph R.; Jones, Kermit M., Jr.; Landis, John M.; Snyder, Clair W., Jr.; Woratyla, John A.; and Zell, Dale R., 4,489,998, Cl. 339-17.0LM.
Goodwin, Paul A.: *See*—
DuPont, John G.; and Goodwin, Paul A., 4,490,314, Cl. 264-22.000.
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Brown, Paul R.; and Fresch, Henry D., 4,489,474, Cl. 29-508.000.
Long, Barry W.; and Roush, David H., deceased, 4,489,760, Cl. 139-11.000.
Goosens, Andre F. L.: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Steffes, Helmut; Bleckmann, Hans-Wilheim; Goosens, Andre F. L.; van Kelst, Willi; and Weise, Lutz, 4,489,989, Cl. 303-92.000.
Gordon, Arnold S., to Circuits & Systems, Inc. Resilient mounted multiple load element weigh scale. 4,489,797, Cl. 177-128.000.
Gordon, James A., III: *See*—
Bruckler, Joseph M.; Gordon, James A., III; and Scalise, Stanley J., 4,490,039, Cl. 356-121.000.
Gordon, James R. Scraper blade for a belt conveyor. 4,489,823, Cl. 198-499.000.
Gordon, Lucas S.; and Sutherland, Karl M., to Bentley Laboratories, Inc. Blood filter. 4,490,254, Cl. 210-247.000.
Gordon, Robert L.; Maugle, George H.; and Cooper, Keith A., to International Paper Company. Container for storing food and process and apparatus for making that container. 4,489,537, Cl. 53-511.000.
Gordon, Ronald F.; and Smith, Ronald A., to Matsushita Electric Industrial Co., Ltd. Dip carrier and socket. 4,490,001, Cl. 339-17.0CF.
Goring, John O., to Scott Bader Company Limited. Raising the flash point of styrene-containing, free-radical curing resins. 4,490,503, Cl. 524-462.000.
Gorog, Sandor: *See*—
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Honty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos, 4,490,378, Cl. 424-262.000.
Gorovets, Petr M.: *See*—
Maslyaev, Viktor S.; Sagalovsky, Evgeny S.; Khudosovtseva, Galina P.; Gorovets, Petr M.; Filimonova, Ljudmila Y.; and Zborschik, Ljubov A., 4,490,274, Cl. 252-186.220.
Gorton, Lo G.; Jaegfeldt, Hans A.; Torstensson, Arne B.; and Johansson, Gillis R. Electrode for the electrochemical regeneration of coenzyme, a method of making said electrode, and the use thereof. 4,490,464, Cl. 435-4.000.
Goto, Kuniaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Integrable quadrature FM demodulator using fewer signal pins. 4,490,680, Cl. 329-117.000.
Gottlieb, A. Arthur, to Imreg, Inc. Sensitive tests for malignancies based on DNA detection. 4,490,472, Cl. 436-504.000.
Gottlieb, Milton S.: *See*—
Steinbruegge, Kenneth B.; and Gottlieb, Milton S., 4,490,845, Cl. 382-1.000.
Gottwald, Karl-Heinz; and Opitz, Reinhard, to Henkel Kommanditgesellschaft auf Aktien. Phosphating solutions and process. 4,490,185, Cl. 148-6.15Z.
Gotz, Edgar: *See*—
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Paupel, Werner; and Gotz, Edgar, 4,489,698, Cl. 123-502.000.
Gouin, Alain: *See*—
Bodin, Claude; and Gouin, Alain, 4,490,228, Cl. 204-192.00R.
Gould, Francis E.; and Johnston, Christian W., to Tyndale Plains-Hunter, Ltd. Polyurethane polyene compositions. 4,490,423, Cl. 428-36.000.
Gould Inc.: *See*—
Ramsay, Glynn R.; and Salmon, Dennis J., 4,490,446, Cl. 429-57.000.
Gourdon, Claude; and Thivend, Jean, to Lignes Telegraphiques et Telephoniques. Information transcoding process and a transmission system using such a process. 4,490,712, Cl. 340-347.0DD.
Grabbe, Dimitry G.: *See*—
Bakermans, Johannes C. W.; and Grabbe, Dimitry G., 4,489,871, Cl. 226-52.000.
Graham, James E. Golf ball marker holder. 4,489,444, Cl. 2-160.000.
Grant, Eric M.; and Walker, John E., to Carl Freudenberg, Firma. Adhesive webs and their production. 4,490,427, Cl. 428-107.000.
Gravener, Roy D.: *See*—
Crawford, John O.; and Gravener, Roy D., 4,489,875, Cl. 227-19.000.

Graziano, James M.: *See*—
Gerhart, Grant R.; and Graziano, James M., 4,490,851, Cl. 382-43.000.
Grealy, Jennifer M.: *See*—
Maurice, Terrence J.; and Grealy, Jennifer M., 4,490,397, Cl. 426-276.000.
Great Lakes Carbon Corporation: *See*—
Stecker, Glenroy, 4,490,244, Cl. 208-131.000.
Turban, Martin M.; Moore, Lyman T.; and Travers, Mark D., 4,490,824, Cl. 373-93.000.
Grebenkin, Mikhail F.; Ivashenko, Alexandr V.; Karamysheva, Ljudmila A.; Blinov, Lev M.; Kovshev, Evgeny I.; Shtykov, Nikolai M.; Titov, Viktor V.; Shoshin, Vadim M.; Agafonova, Irina F.; and Barnik, Mikhail I. Mesomorphic material with low optical anisotropy and process for producing same. 4,490,277, Cl. 252-299.600.
Greene, Mark I.; and Fields, Bernard N., to President and Fellows of Harvard College. Screening vaccines and immunization process. 4,490,358, Cl. 424-86.000.
Gregory, Jack T., to Gregory Tool Systems, Inc. Hydraulic pulling tool. 4,489,471, Cl. 29-243.520.
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Gregory, Jack T., 4,489,471, Cl. 29-243.520.
Gregson, Donald L., to Harris Corporation. Cutting tool for jacketed cable. 4,489,491, Cl. 30-90.700.
Gregson, Robert D.: *See*—
Cooper, John; Reid, David S.; Mumme-Young, Colin A.; and Gregson, Robert D., 4,490,195, Cl. 149-2.000.
Griese, Robert R.: *See*—
Brown, Brandt G., 4,489,520, Cl. 51-5.00D.
Griffith, Carl D.; Rauschelbach, Paul A.; Robinson, Robert W.; and Skutecki, Edmund R., to Sperry Corporation. Altitude preselect system for aircraft without air data computer. 4,490,794, Cl. 364-433.000.
Griggs, Frederick J. M., to Ling Dynamic Systems Limited. Vibration testing apparatus. 4,489,612, Cl. 73-663.000.
Grigsby, Robert A., Jr.: *See*—
Peterson, Bruce W.; Speranza, George P.; and Grigsby, Robert A., Jr., 4,490,485, Cl. 521-48.000.
Grigsby, William E.: *See*—
Bisot, Thomas C.; and Grigsby, William E., 4,490,484, Cl. 521-27.000.
Grimmer, George G.: *See*—
Raulins, George M.; Grimmer, George G.; and Peterson, James L., 4,489,963, Cl. 285-350.000.
Grishakov, Viktor I.: *See*—
Shamarokov, Alexandr S.; Kuzmin, Alexei V.; Glebov, Vladimir P.; Moskvichev, Viktor F.; Morozova, Nadezhda A.; Filippov, Gennady A.; Tarankov, Gennady A.; Lukasevich, Boris I.; Andreev, Leonid M.; and Grishakov, Viktor I., 4,489,788, Cl. 122-32.000.
Grobety, Pierre: *See*—
Badertscher, Ernest; and Grobety, Pierre, 4,489,887, Cl. 239-132.100.
Groliere, Francoise: *See*—
Dolizy, Pierre; and Groliere, Francoise, 4,490,605, Cl. 250-213.0VT.
Grotloh, Karlheinz, to Sulzer Brothers Limited. Shut-off valve. 4,490,836, Cl. 376-281.000.
Grumet, Alex; and Wohlers, Martin R., Jr., to Grumman Aerospace Corporation. Correlation plane recognition processor. 4,490,849, Cl. 382-31.000.
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Grumet, Alex; and Wohlers, Martin R., Jr., 4,490,849, Cl. 382-31.000.
Grutter, William G.: *See*—
Worst, Joel G.; Grutter, William G.; and Bramer, Walter C., 4,489,874, Cl. 227-7.000.
Gsell, Laurenz: *See*—
Hoegerle, Karl; Gsell, Laurenz; and Wehrli, Rudolf, 4,490,375, Cl. 424-251.000.
GTE Automatic Electric Labs Inc.: *See*—
Edwards, Ivan L.; Macrander, Max S.; and Khan, Ashfaq R., 4,490,581, Cl. 179-18.0EE.
GTE Laboratories Incorporated: *See*—
Sanchez, Jaime; and Sarin, Vinod K., 4,489,796, Cl. 175-410.000.
GTE Products Corporation: *See*—
Kuo, Samuel C., 4,490,725, Cl. 343-792.500.
Mizuhara, Howard, 4,490,437, Cl. 428-606.000.
Ritsko, Joseph E.; and Acla, Howard L., 4,490,340, Cl. 423-65.000.
Guenther, Horst H.; and Roesl, Wolfgang, to International Standard Electric Corporation. Rotary switch. 4,490,588, Cl. 200-11.00R.
Guenzer, Charles S.: *See*—
Schneider, Irwin; and Guenzer, Charles S., 4,490,016, Cl. 350-397.000.
Guhne, Wieland: *See*—
Simm, Hans-Peter; and Guhne, Wieland, 4,489,620, Cl. 74-42.000.
Guibert, Raul. Multi-stage automatic dough-producing system. 4,490,046, Cl. 366-76.000.
Gulf Canada Limited: *See*—
Stipdonk, Gustaaf, 4,489,828, Cl. 198-847.000.
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Vogel, Roger F.; Rennard, Raymond J.; and Tabacek, Joseph A., 4,490,479, Cl. 502-309.000.
Vogel, Roger F.; Rennard, Raymond J.; and Tabacek, Joseph A., 4,490,483, Cl. 502-309.000.
Gupta, Arunava; West, Gary A.; and Donlan, Jeffrey P., to Allied Corporation. Stable suspensions of boron, phosphorus, antimony and arsenic dopants. 4,490,192, Cl. 148-188.000.
Gurgiolo, Arthur E.; and Knobel, Thomas M., to Dow Chemical Company, The. Electroconductive foams. 4,489,913, Cl. 521-53.000.
Gusky, Frank J.: *See*—
Acomb, Byron H.; and Gusky, Frank J., 4,489,751, Cl. 137-505.360.
Guterman, Daniel C., to Mostek Corporation. User reprogrammable programmed logic array. 4,490,812, Cl. 364-900.000.
Gutierrez, Beatriz: *See*—
Martinez, Isidro A.; and Gutierrez, Beatriz, 4,489,815, Cl. 190-1.000.
H & B Technologies, Inc.: *See*—
Baumberg, Iosif, 4,489,731, Cl. 128-690.000.
Haas, Max, to Inventio AG. Lift landing door frame arrangement. 4,489,527, Cl. 52-217.000.
Hackett, Walter J.; and Ito, Kyle K., to Purex Corporation. Sanitizing liquid shampoo for carpets. 4,490,270, Cl. 252-106.000.
Hacking, Andrew J.: *See*—
Jarman, Trevor R.; and Hacking, Andrew J., 4,490,467, Cl. 435-101.000.
Hadden, David M., to Delphian Corporation. Method and apparatus for gas detector calibration. 4,489,590, Cl. 73-1.00G.
Hagan Engineering, Inc.: *See*—
Hagan, James C.; and Hagan, Owen C., 4,490,801, Cl. 364-564.000.
Hagan, James C.; and Hagan, Owen C., to Hagan Engineering, Inc. Article sizing apparatus and container filling system employing the same. 4,490,801, Cl. 364-564.000.
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Hagan, James C.; and Hagan, Owen C., 4,490,801, Cl. 364-564.000.
Haile, Ernest. Magnetic flow switch. 4,490,592, Cl. 200-81.90M.
Hait, Paul W., to Pyromid, Inc. Multi-purpose fuel efficient portable stove/heater. 4,489,706, Cl. 126-9.00R.
Hakkenberg, Peter, to Caterpillar Tractor Co. Axle shaft and pump drive mechanism. 4,489,623, Cl. 74-378.000.
Halcour, Kurt; Lange, Peter-Michael; and Wagner, Rudolf, to Bayer Aktiengesellschaft. SO_3/Imide adducts, process for their preparation and their use as sulphonating agents. 4,490,487, Cl. 521-53.000.
Hale, Thomas E., to General Electric Company. Coated product and process. 4,490,191, Cl. 148-31.500.
Hall, Donald C. Portable cervical traction apparatus. 4,489,715, Cl. 128-75.000.
Hall, James C.: *See*—
Van Sloun, Peter H.; and Hall, James C., 4,489,654, Cl. 102-204.000.
Hall. Robert T., to Williams International Corporation. Process for the production of gas turbine engine rotors and stators. 4,489,469, Cl. 29-156.80R.
Halliburton Company: *See*—
Ayers, William M., 4,489,665, Cl. 110-250.000.
Beck, Harold K., 4,489,786, Cl. 166-374.000.
Cole, Robert C., 4,489,785, Cl. 166-295.000.
Stegemoeller, Calvin L.; and Walker, Lonnie R., 4,490,047, Cl. 366-132.000.
Hamanaka, Mitsuyoshi: *See*—
Kawarada, Hiroshi; Tatsumichi, Toshio; Wakahata, Yasuo; Hamanaka, Mitsuyoshi; and Kajitani, Tamotsu, 4,490,015, Cl. 350-340.000.
Hamanaka, Toshiyuki: *See*—
Ogawa, Yutaka; Yamada, Shunichi; and Hamanaka, Toshiyuki, 4,489,774, Cl. 165-10.000.
Hamari Chemicals, Ltd.: *See*—
Maki, Yoshifumi; Sako, Magoichi; Mitsumori, Naomichi; Maeda, Sadayuki; and Takaya, Masahiro, 4,490,292, Cl. 260-239.30B.
Hamersma, Robert, to U.S. Philips Corporation. Color television display tube. 4,490,645, Cl. 313-440.000.
Hamilton, Raoul; Sehlin, Lars E.; and Svensson, Sten A., to Hamilton, Raoul. Apparatus for the conversion of energy. 4,489,678, Cl. 122-26.000.
Hamilton, W. Duane, to N. A. Taylor Company, Inc. Wheelchair. 4,489,955, Cl. 280-242.0WC.
Hammer, Karl, to Aeromatic AG. Steam granulation apparatus and method. 4,489,504, Cl. 34-10.000.
Hammond, Robert B.; Paulter, Nicholas G.; and Wagner, Ronald S., to United States of America, Energy. InP:Fe Photoconducting device. 4,490,709, Cl. 338-15.000.
Han, Eui M., to Shinhan Kongki Co., Ltd. Water meter with an anti-reverse-rotation device. 4,489,600, Cl. 73-275.000.
Handley, John E., to Matamata Motor Trimmers Limited. Animal support sling. 4,489,677, Cl. 119-102.000.
Hands-England Drilling Limited: *See*—
Box, Frederick J., 4,490,096, Cl. 417-342.000.
Hanisch, Horst: *See*—
Amort, Jurgen; Hanisch, Horst; Klapdor, Ute; Suerken, Hans P.; and van der Maas, Hendrikus, 4,490,526, Cl. 536-102.000.
Hanlon, Jim C. Clamping system for heavy "I" beams and the like on oil rigs, etc. 4,490,066, Cl. 403-387.000.
Hann, Paul D.: *See*—
Van Pool, Joe; and Hann, Paul D., 4,490,563, Cl. 568-697.000.
Van Pool, Joe; and Hann, Paul D., 4,490,572, Cl. 585-800.000.
Hanna, Marie R.: *See*—
Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; Vock, Manfred H.; and Wiegers, Wilhelmus J., 4,490,404, Cl. 426-536.000.
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,490,544, Cl. 549-228.000.

Hansen, James E., to Eaton Corporation. Engine starter protective and control module and system. 4,490,620, Cl. 290-38.00R.
Hansen, James E., to Eaton Corporation. Voltage controlled, variable time delay electronic interval timer for motor control. 4,490,659, Cl. 318-484.000.
Harada, Kazuo: *See*—
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Harada, Kazuo; and Konno, Takeo, 4,490,434, Cl. 428-341.000.
Haraguchi, Hiroshi; Narita, Kou; Iwata, Toshiharu; and Baba, Yasutoshi, to Nippondenso Co., Ltd. Ignition timing control system for internal combustion engine with knock sensor. 4,489,692, Cl. 123-425.000.
Hardie, George S.; Hernandez, Raphael; and Maybell, Michael J., to Raytheon Company. Parallel plate lens antenna. 4,490,723, Cl. 343-754.000.
Hardwick, William H.; and Gayler, Ronald, to United Kingdom Atomic Energy Authority. Treatment of substances. 4,490,287, Cl. 252-629.000.
Hare, Alan W.; Murr, Lawrence E.; and Carlson, F. Paul, to Oregon Graduate Center for Study and Research. Implosive consolidation of a particle mass including amorphous material. 4,490,329, Cl. 419-51.000.
Hareyama, Kyuichi, to Nippon Electric Co., Ltd. Semiconductor circuit. 4,490,634, Cl. 307-573.000.
Harmony, Daniel C.: *See*—
Minney, Stephen C.; and Harmony, Daniel C., 4,490,598, Cl. 219-10.810.
Harmsen, John L., to Stedef S.A. Railroad tie cover. 4,489,884, Cl. 238-1.000.
Harris Corporation: *See*—
Gregson, Donald L., 4,489,491, Cl. 30-90.700.
Harris, John W., to Uniroyal Ltd. Synthesis of 2-[1-(2,5-dimethylphenyl)ethylsulfonyl]pyridine-1-oxide herbicide and intermediates therefor. 4,490,532, Cl. 546-294.000.
Harris, Richard L.: *See*—
Nelson, Eric L.; and Harris, Richard L., 4,490,389, Cl. 424-280.000.
Harrison Equipment Co., Inc.: *See*—
McMinn, Robert R., 4,490,619, Cl. 290-2.000.
Harrison, Joel N.; Daniels, Donald V.; and Brown, David A., to Quantum Corporation. Pure torque, limited displacement transducer. 4,490,635, Cl. 310-38.000.
Hartl, Alfons: *See*—
von Horst, Louis; and Hartl, Alfons, 4,490,405, Cl. 426-600.000.
Hartman, Dennis C., to Texas Instruments Incorporated. Plasma etching using hydrogen bromide addition. 4,490,209, Cl. 156-643.000.
Hartup Tool, Inc.: *See*—
Gall, Owen M.; Thomson, Thomas L.; and Taylor, Robert S., 4,489,584, Cl. 72-327.000.
Harvey Hubbell Incorporated: *See*—
Neuroth, David H., 4,490,577, Cl. 174-103.000.
Harwath, Frank L.: *See*—
Hunsberger, Dale L.; and Harwath, Frank L., 4,490,105, Cl. 431-65.000.
Hasegawa, Hiroshi; Tsutsui, Yoshitaka; Horikawa, Yoshinori; and Miyakawa, Seii, to Hitachi, Ltd. CRT mounting structure. 4,489,993, Cl. 312-7.200.
Hasegawa, Junzo; Kawabata, Susumu; Horiuchi, Mitsunori; and Suzuki, Yoshihisa, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and apparatus for textile fiber drafting. 4,489,461, Cl. 19-258.000.
Hashimoto, Hiroyuki: *See*—
Takeuchi, Hideo; Kobayashi, Michiaki; Hashimoto, Hiroyuki; and Suzuki, Daiji, 4,489,652, Cl. 101-211.000.
Hashimoto, Yutaka: *See*—
Tsukimoto, Toshiaki; Matsunaga, Chiharu; and Hashimoto, Yutaka, 4,489,644, Cl. 91-530.000.
Haskin, Helen K.: *See*—
Davis, Lorne A., Jr.; Brost, Dale F.; and Haskin, Helen K., 4,490,676, Cl. 324-376.000.
Hasler, Werner; Padmanabhan, Subramaniam; and Staudenmaier, Klaus, to International Business Machines Corporation. Type belt printer with antifriction means. 4,489,650, Cl. 101-93.140.
Hasson, Harrith M. Gynecological instrument. 4,489,732, Cl. 128-778.000.
Hata, Kunio: *See*—
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Ishiguro, Ken; Nagai, Koichi; and Hata, Kunio, 4,490,435, Cl. 428-341.000.
Hatakeyama, Morichika; and Minami, Koichi, to Tomy Kogyo Co., Inc. Manipulative egg-shaped puzzle. 4,489,944, Cl. 273-154.000.
Hataya, Masanori: *See*—
Tanaka, Toru; Hataya, Masanori; and Tanaka, Kazuo, 4,490,554, Cl. 562-486.000.
Hattori, Takashi: *See*—
Kobayashi, Nobuyuki; Itoh, Hiroshi; and Hattori, Takashi, 4,489,696, Cl. 123-493.000.
Hauel, Norbert: *See*—
Reiffen, Manfred; Heider, Joachim; Hauel, Norbert; Austel, Volkhard; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Noll, Klaus; Pieper, Helmut; Kruger, Gerd; and Keck, Johannes, 4,490,369, Cl. 424-244.000.
Hauni-Werke Korber & Co. KG: *See*—
Gomann, Rolf; and Krause, Lothar, 4,489,534, Cl. 53-151.000.
Wochnowski, Waldemar, 4,489,737, Cl. 131-302.000.
Hausermann, Walter: *See*—
Laanio, Verena; von Orelli, Marcus; and Hausermann, Walter, 4,490,372, Cl. 424-249.000.
Hausler, Peter; and Nathrath, Norbert, to Thyssen Industrie AG. Hydride storage for hydrogen. 4,489,564, Cl. 62-48.000.
Hayashi, Yukitaka: *See*—
Moribe, Yoshihiro; Hayashi, Yukitaka; and Mitamura, Masahiro, 4,490,662, Cl. 318-685.000.
Hayatsu, Hikoya; and Tezuka, Yasuo, to Sumitomo Chemical Company, Limited. Polysaccharides containing phthalocyanine nucleus. 4,490,525, Cl. 536-54.000.
Hayes, Gerald G.: *See*—
Meyer, Leonard S.; Murray, Michael J.; Hayes, Gerald G.; and McClain, Robert L., 4,489,876, Cl. 228-170.000.
Haythornthwaite, Peter F., to Merryware Industries, Inc. Handle. 4,489,912, Cl. 248-359.000.
Heath Company: *See*—
Hornback, Donald L., 4,490,741, Cl. 358-152.000.
Heck, Edward A., to Black & Decker Inc. Replaceable spindle lock system. 4,489,525, Cl. 51-170.00R.
Heeres, Jan; and Backx, Leo J. J., to Janssen Pharmaceutica N.V. Heterocyclic derivatives of (4-phenylpiperazin-1-yl-aryloxymethyl-1,3-dioxolan-2-yl)-methyl-1H-imidazoles and 1H-1,2,4-triazoles. 4,490,530, Cl. 544-370.000.
Heeres, Jan; and Van der Veken, Louis J. E., to Janssen Pharmaceutica N.V. (2-Aryl-4-phenylthioalkyl-1,3-dioxolan-2-ylmethyl)azole derivatives. 4,490,540, Cl. 548-336.000.
Heffner, Richard M.: *See*—
Over, William R.; Wion, Donald A.; and Heffner, Richard M., 4,489,476, Cl. 29-564.400.
Heider, Joachim: *See*—
Reiffen, Manfred; Heider, Joachim; Hauel, Norbert; Austel, Volkhard; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Noll, Klaus; Pieper, Helmut; Kruger, Gerd; and Keck, Johannes, 4,490,369, Cl. 424-244.000.
Heijnen, Joseph J.; Lourens, Pieter A.; Venema, Cornelis P.; and Vroemen, Albert J., to Gist-Brocades N.V. Sludgeless oxidative biological purification process. 4,490,258, Cl. 210-617.000.
Heilweil, Israel J., to Mobil Oil Corporation. Acidic high temperature stable aqueous brine fluids viscosified by basic N-heterocyclic polymers. 4,490,261, Cl. 252-8.50A.
Heinzer, Franz: *See*—
Ghisalba, Oreste; Heinzer, Franz; and Kuenzi, Martin, 4,490,471, Cl. 435-253.000.
Heldebrant, Charles M., to Alpha Therapeutic Corporation. Virus inactivating heat treatment of plasma fractions. 4,490,361, Cl. 424-101.000.
Helderman, Earl R.: *See*—
Zimmerman, Robert R.; Kunkler, Larry D.; and Helderman, Earl R., 4,490,408, Cl. 427-42.000.
Helenschmidt, Dale J.: *See*—
Prange, Bernard H.; and Helenschmidt, Dale J., 4,489,870, Cl. 225-2.000.
Helger, Roland: *See*—
Limbach, Berthold; and Helger, Roland, 4,490,465, Cl. 435-14.000.
Heller, Juerg, to Sandoz Ltd. Use of polyoxyalkylated alkyl phenols as dyeing assistants for disperse dyes. 4,490,150, Cl. 8-610.000.
Helms, Charles R., to Container Corporation of America. Tamper-evident container. 4,489,832, Cl. 206-387.000.
Hench, Hans; Lettner, Horst; and Hunke, Friedrich, to Automatik Apparate-Maschinenbau H. Hench GmbH. Device for the dehydration and drying of solids, especially of hydraulically(underwater-)granulated plastic materials. 4,489,505, Cl. 34-57.00R.
Henke, John R., to Dean Research Corporation. Apparatus for lifting heavy metal plate materials. 4,489,970, Cl. 294-67.0AB.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Behr, Norbert; van der Mei, Henk; Sirtl, Wolfgang; Schnegelberger, Harald; and von Ettingshausen, Othmar, 4,490,398, Cl. 426-312.000.
Gottwald, Karl-Heinz; and Opitz, Reinhard, 4,490,185, Cl. 148-6.15Z.
vom Hofe, Dieter; and Vierkotter, Peter, 4,489,859, Cl. 222-183.000.
Henning, Wolfram. Rod-like apparatus for determining the existing level of liquids in containers, channels, or the like. 4,489,602, Cl. 73-327.000.
Hennings, George N.; Nickles, Richmond H.; Brauer, Larry F.; and DeHarrold, Raymond H., to United States of America, Navy. Penetrating ordnance safe and arming mechanism. 4,489,656, Cl. 102-254.000.
Henseleit, Roland; and Kolb, Carl-Joachim, to Prazisions-Technik GmbH. Method and device for the storage of selected points of a nominal contour line in a projection profile grinder. 4,489,522, Cl. 51-165.710.
Henson, Glen E.: *See*—
Fisher, Milton W.; and Henson, Glen E., 4,489,933, Cl. 272-65.000.
Hentschel, Karl-Heinz; Mussig, Bernhard; Dhein, Rolf; and Kuasi, Siegfried, to Bayer Aktiengesellschaft. Process for the preparation of liquids of low inflammability and high viscosity index and the use thereof. 4,490,266, Cl. 252-49.800.
Her Majesty the Queen in right of Canada: *See*—
Mathieu, Pierre, 4,490,482, Cl. 502-339.000.
Her Majesty the Queen in right of the Providence of Alberta, Alberta Oil Sands Equity: *See*—
Stipdonk, Gustaaf, 4,489,828, Cl. 198-847.000.
Herchenbach, Paul: *See*—
Konrad, Mathias; Herchenbach, Paul; and Kampf, Klaus, 4,490,125, Cl. 464-11.000.

Hercules Incorporated: *See—*
Funk, Richard L., 4,490,196, Cl. 149-92.000.
Hernandez, Raphael: *See—*
Hardie, George S.; Hernandez, Raphael; and Maybell, Michael J., 4,490,723, Cl. 343-754.000.
Hess, Johann. Device for measuring the fold angle in a sheet metal bending press. 4,489,586, Cl. 72-389.000.
Heurich, Gunther: *See—*
Weiss, Siegfried; Heurich, Gunther; and Kotzab, Werner, 4,490,128, Cl. 474-166.000.
Hewlett-Packard Company: *See—*
Vaught, John L.; Cloutier, Frank L.; Donald, David K.; Meyer, John D.; Tacklind, Christopher A.; and Taub, Howard H., 4,490,728, Cl. 346-1.100.
Vaught, John L., 4,490,731, Cl. 346-140.00R.
Hiebert, Jacob F., to Pennwalt Corporation. Fruit cup dampening device. 4,489,822, Cl. 198-478.000.
Higaki, Hiroshi: *See—*
Kamohara, Hideaki; Imamura, Minoru; Higaki, Hiroshi; Yoshitomi, Yuji; Uno, Syuzo; Makino, Kazuhiro; Nomura, Hiroshi; and Yoshioka, Kyozo, 4,489,659, Cl. 104-124.000.
Higaki, Seiji: *See—*
Ito, Yoshifumi; Yanagi, Kenichi; Shinoda, Naoharu; and Higaki, Seiji, 4,490,161, Cl. 55-181.000.
Higashi, Iwao: *See—*
Aoki, Eiichiro; and Higashi, Iwao, 4,489,636, Cl. 84-1.010.
Higgins, Euel V.: *See—*
Coston, Charles J.; and Higgins, Euel V., 4,490,053, Cl. 374-5.000.
High Voltage Engineering Corporation: *See—*
DuPont, John G.; and Goodwin, Paul A., 4,490,314, Cl. 264-22.000.
Hikita, Mitsutaka: *See—*
Takeuchi, Hiroshi; Jyo mura, Shigeru; Nagatsuma, Kazuyuki; Hikita, Mitsutaka; Ito, Yukio; and Ashida, Sakichi, 4,490,641, Cl. 310-366.000.
Hill, Murray K.; and McConnell, William H., to International Business Machines Corporation. Magnetic recording disk cleaning using controlled actuator motion. 4,490,766, Cl. 360-137.000.
Hill, Stuart A., to Beecham Group Limited. Pharmaceutical composition. 4,490,383, Cl. 424-271.000.
Himuro, Masami; Nishigaki, Susumu; and Terunuma, Kazuhiko, to Sony Corporation. Color image reproducing apparatus. 4,490,739, Cl. 358-66.000.
Hindi, Ivan: *See—*
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Honty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos, 4,490,378, Cl. 424-262.000.
Hiraga, Masaharu: *See—*
Terauchi, Kiyoshi; and Hiraga, Masaharu, 4,490,099, Cl. 418-55.000.
Hirai, Yukio; Amagami, Keizo; Kobayashi, Takao; and Matsumoto, Shinichi, to Matsushita Electric Industrial Co., Ltd. Induction cooking apparatus having cooling arrangement therefor. 4,490,596, Cl. 219-10.49R.
Hiramatsu, Seiichirou: *See—*
Tsuda, Tadashi; Hiramatsu, Seiichirou; Maeno, Tsuyoshi; and Ohtsuka, Mitsugi, 4,490,716, Cl. 340-904.000.
Hiramura, Kazuo: *See—*
Nagai, Shunichi; and Hiramura, Kazuo, 4,489,578, Cl. 72-21.000.
Hirano, Takao: *See—*
Fujiwara, Tatsuro; Watanabe, Hideyuki; Hirano, Takao; and Sakakibara, Hideo, 4,490,524, Cl. 536-7.100.
Hirao, Yotaro: *See—*
Kawaguchi, Yasushi; Mine, Kiyomitsu; Ide, Keiko; Yamashita, Yukie; Irie, Soichiro; and Hirao, Yotaro, 4,490,462, Cl. 430-543.000.
Hirata, Hitoshi: *See—*
Nishioka, Akira; and Hirata, Hitoshi, 4,490,838, Cl. 381-15.000.
Hirata, Makizo: *See—*
Fujikawa, Tetsuzo; Hirata, Makizo; and Tamba, Shinichi, 4,490,309, Cl. 261-52.000.
Hirooka, Susumu: *See—*
Masuyama, Masaru; Hirooka, Susumu; and Yamaoka, Nobutatsu, 4,490,318, Cl. 264-61.000.
Hirose, Ryoichi: *See—*
Suzuki, Tomio; Tamura, Setsuo; Tanaka, Kozo; Hirose, Ryoichi; Komatsu, Hiroyuki; Tamada, Shinichi; Kasai, Taketsugu; and Tanimoto, Keisuke, 4,490,171, Cl. 75-42.000.
Hirose, Takao: *See—*
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, 4,490,239, Cl. 208-44.000.
Hiroshi, Niimi: *See—*
Susumu, Kawabata; Hiroshi, Niimi; Meiji, Anahara; and Hiroshi, Omori, 4,489,545, Cl. 57-333.000.
Hiroshi, Omori: *See—*
Susumu, Kawabata; Hiroshi, Niimi; Meiji, Anahara; and Hiroshi, Omori, 4,489,545, Cl. 57-333.000.
Hirota, Akira, to Victor Company of Japan, Ltd. Color video signal recording and/or reproducing system. 4,490,749, Cl. 358-320.000.
Hirsch, Martin: *See—*
Formanek, Lothar; Hirsch, Martin; Schnabel, Wolfram; Serbent, Harry; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Arlt, Detmar, 4,490,168, Cl. 75-10.00R.
Hitachi Cable, Ltd.: *See—*
Suzuki, Shohei; Kazawa, Yoshiaki; Saito, Ryusei; Noguchi, Koji; Moriai, Hidezumi; Mashiko, Ryoichi; and Sakai, Shuji, 4,490,578, Cl. 174-15.00S.
Hitachi Chemical Co., Ltd.: *See—*
Maekawa, Iwao; Omori, Eiji; Uchigasaki, Isao; Tobita, Hideyuki; Yokoyama, Naoki; Tanno, Seikichi; Nakano, Fumio; and Ito, Ren, 4,490,496, Cl. 524-317.000.
Hitachi Construction Machinery Co., Ltd.: *See—*
Okabe, Nobuya, 4,489,805, Cl. 180-271.000.
Watanabe, Hiroshi; and Izumi, Eiki, 4,489,551, Cl. 60-328.000.
Watanabe, Hiroshi; and Izumi, Eiki, 4,489,552, Cl. 60-389.000.
Hitachi Koki Co., Ltd.: *See—*
Monma, Hisayoshi; Miyasaka, Masao; and Kubo, Kazuyuki, 4,490,058, Cl. 400-146.000.
Hitachi, Ltd.: *See—*
Hasegawa, Hiroshi; Tsutsui, Yoshitaka; Horikawa, Yoshinori; and Miyakawa, Seii, 4,489,993, Cl. 312-7.200.
Ito, Shigeyuki; and Watatani, Yoshizumi, 4,490,753, Cl. 360-19.100.
Kamohara, Hideaki; Imamura, Minoru; Higaki, Hiroshi; Yoshitomi, Yuji; Uno, Syuzo; Makino, Kazuhiro; Nomura, Hiroshi; and Yoshioka, Kyozo, 4,489,659, Cl. 104-124.000.
Maekawa, Iwao; Omori, Eiji; Uchigasaki, Isao; Tobita, Hideyuki; Yokoyama, Naoki; Tanno, Seikichi; Nakano, Fumio; and Ito, Ren, 4,490,496, Cl. 524-317.000.
Momono, Masakichi, 4,489,891, Cl. 239-585.000.
Moribe, Yoshihiro; Hayashi, Yukitaka; and Mitamura, Masahiro, 4,490,662, Cl. 318-685.000.
Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,490,044, Cl. 366-17.000.
Shiohata, Kouki; Fujisawa, Fumio; Watanabe, Takashi; and Ishibashi, Yasumasa, 4,489,606, Cl. 73-462.000.
Suzuki, Shohei; Kazawa, Yoshiaki; Saito, Ryusei; Noguchi, Koji; Moriai, Hidezumi; Mashiko, Ryoichi; and Sakai, Shuji, 4,490,578, Cl. 174-15.00S.
Takeuchi, Hiroshi; Jyo mura, Shigeru; Nagatsuma, Kazuyuki; Hikita, Mitsutaka; Ito, Yukio; and Ashida, Sakichi, 4,490,641, Cl. 310-366.000.
Tanamachi, Tokunosuke; Narita, Hiroshi; Ibamoto, Masahiko; and Okamatsu, Shigetoshi, 4,490,666, Cl. 318-800.000.
Tosaki, Hiromi; Sugishita, Nobuyuki; and Ikegami, Akira, 4,490,429, Cl. 428-195.000.
Tsuchihashi, Akira, 4,490,660, Cl. 318-565.000.
Wyatt, Philip J.; Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,490,042, Cl. 356-340.000.
Hitachi Metals, Ltd.: *See—*
Umehara, Teruo; and Matsumoto, Norio, 4,490,815, Cl. 369-43.000.
Hiyama, Hirokuni: *See—*
Kataoka, Tadashi; and Hiyama, Hirokuni, 4,489,951, Cl. 277-83.000.
Hobart Corporation: *See—*
Treiber, Fritz F., 4,489,533, Cl. 53-228.000.
Hobbs, Charles F., to Monsanto Company. Catalyst and reverse disproportionation process. 4,490,477, Cl. 502-243.000.
Hochtemperatur-Reaktorbau GmbH.: *See—*
Schoening, Josef; Schwiers, Hans-Georg; Elter, Claus; Stracke, Wilfried; and Kolodzey, Hans-Juergen, 4,490,328, Cl. 376-285.000.
Hoegerle, Karl; Gsell, Laurenz; and Wehrli, Rudolf, to Ciba-Geigy Corporation. 4-N,N-Dimethylcarbamoyloxy-6-aminopyrimidines and salts thereof, and their use for combating pests. 4,490,375, Cl. 424-251.000.
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, to Robert Bosch GmbH. Fuel injection pump. 4,489,698, Cl. 123-502.000.
Hoff, Raymond E.; and Pullukat, Thomas, to Chemplex Company. High-temperature ethylene polymerization and copolymerization using dialuminoxane cocatalysts. 4,490,514, Cl. 526-165.000.
Hoffend, Thomas R.; and Bruzee, Michelle M., to Xerox Corporation. Amine acid salt charge enhancing toner additives. 4,490,455, Cl. 430-110.000.
Hoffman, Jacob M.: *See—*
Bolhofer, William A.; and Hoffman, Jacob M., 4,490,533, Cl. 546-332.000.
Hoffmann-La Roche Inc.: *See—*
Stern, Alvin S., 4,490,289, Cl. 260-112.00R.
Hogsett, Robert F.: *See—*
Beckstead, Leo W.; Hogsett, Robert F.; and Voelker, Dennis E., 4,490,339, Cl. 423-58.000.
Hold-A-Fold, Inc.: *See—*
Blaas, Wolfgang; Bergl, Friedrich; and Wetmore, Judson D., 4,489,453, Cl. 5-451.000.
Holland, John F.: *See—*
Enke, Christie G.; Newcome, Bruce H.; and Holland, John F., 4,490,806, Cl. 364-734.000.
Holmgren, Klas. Tool for sailing with skates etc. 4,489,957, Cl. 280-810.000.
Holstedt, Richard A.; and Jessup, Peter, to Union Oil Company of California. Lubricating compositions. 4,490,265, Cl. 252-47.500.
Holt, Fletcher O., to Combustion Engineering, Inc. Control system for economic operation of a steam generator. 4,489,679, Cl. 122-451.00S.
Hon, David C. Automated instruction, game and data retrieval system. 4,490,810, Cl. 364-900.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Fukuchi, Kiyoshi, 4,489,803, Cl. 180-227.000.
Yagi, Shizuo; Fujii, Isao; and Ajiki, Yoshio, 4,489,686, Cl. 123-260.000.

Honda, Keisuke. Multi-frequency ultrasonic transducer. 4,490,640, Cl. 310-325.000.
Honda, Makoto; Izawa, Akira; and Moriguchi, Yutaro, to Dai Nippon Insatsu Kabushiki Kaisha. Rear projection screen. 4,490,010, Cl. 350-128.000.
Honda, Yasuhiro: *See*—
Sakano, Hajime; Ito, Akitoshi; Yano, Motoichi; and Honda, Yasuhiro, 4,490,506, Cl. 525-67.000.
Honeywell Inc.: *See*—
Bickman, Bernard F., 4,490,724, Cl. 343-765.000.
Kardashian, Vahram S.; and Benson, Richard D., 4,490,457, Cl. 430-311.000.
Nohava, Thomas E.; and Schmit, Joseph L., 4,490,441, Cl. 428-697.000.
Rodgers, Larry C., 4,489,882, Cl. 236-78.00D.
Staggs, Kevin P.; and Clarke, Charles J., Jr., 4,490,797, Cl. 364-522.000.
Tamura, Poohsan N., 4,490,805, Cl. 364-728.000.
Van Sloun, Peter H.; and Hall, James C., 4,489,654, Cl. 102-204.000.
Honse, James J. Motorized sign with sliding panels. 4,489,514, Cl. 40-476.000.
Honty, Katalin: *See*—
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Honty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos, 4,490,378, Cl. 424-262.000.
Horchos, Leonard A.; and Lorber, Harold W., to International Business Machines Corporation. Precision fluid dispense valve. 4,489,863, Cl. 222-504.000.
Horian, James G.: *See*—
Wolynski, Victor W.; Horian, James G.; and Horian, Robert L., 4,490,761, Cl. 360-128.000.
Horian, Robert L.: *See*—
Wolynski, Victor W.; Horian, James G.; and Horian, Robert L., 4,490,761, Cl. 360-128.000.
Horikawa, Yoshinori: *See*—
Hasegawa, Hiroshi; Tsutsui, Yoshitaka; Horikawa, Yoshinori; and Miyakawa, Seii, 4,489,993, Cl. 312-7.200.
Horiuchi, Mitsunori: *See*—
Hasegawa, Junzo; Kawabata, Susumu; Horiuchi, Mitsunori; and Suzuki, Yoshihisa, 4,489,461, Cl. 19-258.000.
Horl, Adolf: *See*—
Schaib, Albert; Manogg, Horst; and Horl, Adolf, 4,489,624, Cl. 74-479.000.
Hornback, Donald L., to Heath Company. Synchronization signal stabilization for video image overlay. 4,490,741, Cl. 358-152.000.
Horst & Klotz Hopfenveredelung GmbH: *See*—
von Horst, Louis; and Hartl, Alfons, 4,490,405, Cl. 426-600.000.
Horvath, Stephen, to Beeston Company Limited. Hydrogen production. 4,490,349, Cl. 423-657.000.
Horwath, Robert O., to Nabisco Brands, Inc. Method for screening microorganisms for the production of amylolytic enzymes. 4,490,466, Cl. 435-22.000.
Hoshi, Akio, to Canon Denshi Kabushiki Kaisha. Pinch-holder for magnetic disk. 4,490,758, Cl. 360-105.000.
Hoshino, Mitsuo; and Yamamoto, Takashi, to Sony Corporation. Tape cassette. 4,490,763, Cl. 360-132.000.
Hosoi, Yukiharu: *See*—
Isaka, Yoshiharu; and Hosoi, Yukiharu, 4,489,802, Cl. 180-219.000.
Houbregs, Roger J. E.; and Camerik, Eduard, to U.S. Philips Corporation. Optical device. 4,490,011, Cl. 350-255.000.
Houman, John, to LeaRonal, Inc. Electrolytic copper plating solutions. 4,490,220, Cl. 204-52.00R.
House, Gary L., to Eastman Kodak Company. Multicolor photographic elements containing silver iodide grains. 4,490,458, Cl. 430-503.000.
Houston, Theodore W.: *See*—
Everett, Chauncey L.; Houston, Theodore W.; and Darley, Henry M., 4,490,632, Cl. 307-475.000.
Hovey, Dean L., to Minnesota Mining and Manufacturing Company. Electrical connector. 4,490,005, Cl. 339-278.00C.
Howard, Donald R.: *See*—
Lancaster, Henry D.; Fugitt, Jock A.; and Howard, Donald R., 4,490,648, Cl. 315-5.410.
Howes, John G. B.; and Selway, Rupert A., to Anchor Continental Inc. Sulphur dioxide-liberating, sterilizing composition and method of using same. 4,490,330, Cl. 422-29.000.
Hoxan Corporation: *See*—
Inomata, Masashi; Kon, Shizuo; Kaku, Tsukasa; and Shinohara, Shizuo, 4,490,833, Cl. 378-58.000.
Hriscisce, Frank: *See*—
Cherukuri, S. Rao; Bilka, Kenneth P.; Hriscisce, Frank; and Piccolo, Dominic J., 4,490,395, Cl. 426-3.000.
Hsu, Jau Y.; Wedral, Elaine R.; and Klinker, William J., to Societe d'Assistance Technique pour Produits Nestle S. A. Preparation of a flavored solid vegetable and vegetable juice utilizing hydrolysed protein. 4,490,396, Cl. 426-49.000.
Hsu, Michael S., to Massachusetts Institute of Technology. Solid oxide electrochemical energy converter. 4,490,445, Cl. 429-32.000.
Hsu, Ying-Yen, to Merck Patent Gesellschaft mit beschrankter Haftung. Liquid crystal admixtures including chloro-cyanophenyl substituted benzoates. 4,490,276, Cl. 252-299.610.
Huang, Fu-chih: *See*—
Loev, Bernard; Brown, Richard E.; Huang, Fu-chih; and Jones, Howard, 4,490,373, Cl. 424-250.000.
Huber, Siefried; and Merkator, Manfred, to Black & Decker Inc. Control circuit arrangement for an electromagnetically operated power tool. 4,490,771, Cl. 361-154.000.
Hudelmaier, Gerhard, to Hudelmaier, Ingrid. Concrete mixer. 4,490,045, Cl. 366-56.000.
Hudelmaier, Ingrid: *See*—
Hudelmaier, Gerhard, 4,490,045, Cl. 366-56.000.
Hudson's Bay Oil and Gas Company Limited: *See*—
Stipdonk, Gustaaf, 4,489,828, Cl. 198-847.000.
Hughes Aircraft Company: *See*—
Shields, Steven E.; and Robinson, David A., 4,489,479, Cl. 29-575.000.
Hughes, John F.: *See*—
Marchant, John A.; and Hughes, John F., 4,489,894, Cl. 239-693.000.
Huizenga, John R.; and Reddix, Lloyd E., to Eli Lilly and Company. Implant needle and method. 4,490,139, Cl. 604-57.000.
Hull, Warren L.; Leedahl, Wesley C.; and Notch, Donald R., to White Consolidated Industries, Inc. Refrigeration apparatus and method of making same. 4,489,470, Cl. 29-157.30C.
Humes, Dennis W.: *See*—
Daghe, Joseph L.; Sands, Robert E.; and Humes, Dennis W., 4,489,746, Cl. 137-218.000.
Humphries, Michael J.; and Schumacher, Edward B., to Exxon Research and Engineering Co. Anchor for refractory lining. 4,490,333, Cl. 422-241.000.
Hundertmark, James M., to Brunswick Corporation. Hydraulic trim-tilt system. 4,490,120, Cl. 440-61.000.
Hunke, Friedrich: *See*—
Hench, Hans; Lettner, Horst; and Hunke, Friedrich, 4,489,505, Cl. 34-57.00R.
Hunsberger, Dale L.; and Harwath, Frank L., to Sundstrand Corporation. Fuel supply system for a recirculating fuel burner. 4,490,105, Cl. 431-65.000.
Hunter, Scott R.: *See*—
Christophorou, Loucas G.; Carter, James G.; and Hunter, Scott R., 4,490,650, Cl. 315-150.000.
Huszarik, Fred A.: *See*—
Charlebois, Leonard J.; and Huszarik, Fred A., 4,490,315, Cl. 264-40.100.
Hutas, Istvan: *See*—
Ambrus, Dezso ; Szabolcsi, Tamas; and Hutas, Istvan, 4,490,394, Cl. 426-2.000.
Huybrechts, Jozef T., to Du Pont de Nemours, E. I., and Company. Aluminum flake-resin dispersions. 4,490,499, Cl. 524-376.000.
Huzino, Seizi: *See*—
Kohama, Tokio; Huzino, Seizi; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,489,695, Cl. 123-481.000.
Hydro Quebec: *See*—
Jasmin, Gilles, 4,490,808, Cl. 364-802.000.
Hyzak, Daniel L., to Stauffer Chemical Company. Iminophenyl N-methylcarbamates as herbicide extenders. 4,490,166, Cl. 71-100.000.
Ibamoto, Masahiko: *See*—
Tanamachi, Tokunosuke; Narita, Hiroshi; Ibamoto, Masahiko; and Okamatsu, Shigetoshi, 4,490,666, Cl. 318-800.000.
ICI Pharma: *See*—
Jung, Frederic H.; and Davies, Gareth M., 4,490,382, Cl. 424-270.000.
Ide, Keiko: *See*—
Kawaguchi, Yasushi; Mise, Kiyomitsu; Ide, Keiko; Yamashita, Yukie; Irie, Soichiro; and Hirao, Yotaro, 4,490,462, Cl. 430-543.000.
Ideal Industries, Inc.: *See*—
Michaels, Leonard H.; and Stuart, Jerry E., 4,489,490, Cl. 30-90.100.
Ignatuk, Daniel: *See*—
Albrecht, Robert J.; Ignatuk, Daniel; Pinto, Albert A.; and Simelunas, William J., 4,489,632, Cl. 83-404.200.
IGT: *See*—
Pease, Logan L.; and Carmean, Wes F., 4,490,607, Cl. 250-227.000.
Iijima, Toshifumi; Onodera, Kaoru; and Fujimatsu, Wataru, to Konishiroku Photo Industry Co., Ltd. Multi-layered color photo-sensitive material. 4,490,459, Cl. 430-505.000.
Ikeda, Yoneichi: *See*—
Miyauchi, Terukatsu; Ikeda, Yoneichi; and Kikuchi, Tatsuji, 4,490,243, Cl. 208-127.000.
Ikegami, Akira: *See*—
Tosaki, Hiromi; Sugishita, Nobuyuki; and Ikegami, Akira, 4,490,429, Cl. 428-195.000.
Ikezaki, Muneyoshi; Kanno, Takeshi; Iwai, Hajime; and Inamasu, Masanori, to Tanabe Seiyaku Co., Ltd. Benzylalcohol derivative and process for preparing. 4,490,392, Cl. 424-330.000.
Illinois Tool Works Inc.: *See*—
Bakker, John A., 4,489,466, Cl. 24-489.000.
Barth, Gerald D., 4,490,082, Cl. 411-185.000.
Imai, Hidekazu, to Fuji Xerox Co., Ltd. Apparatus for correcting an unevenness in an intensity of illumination of an original in a copying machine capable of variable magnification. 4,490,034, Cl. 355-57.000.
Imai, Tamotsu: *See*—
O'Hara, Mark J.; and Imai, Tamotsu, 4,490,571, Cl. 585-525.000.
Imai, Yoshifumi: *See*—
Mori, Toshihiro; Imai, Yoshifumi; Matsui, Masanori; and Masumura, Masao, 4,490,768, Cl. 361-2.000.
Imamura, Kazuyoshi; Yasui, Koichi; and Saito, Akeomi, to Asahi Kasei Kogyo Kabushiki Kaisha. Method of coating a pencil. 4,490,415, Cl. 427-358.000.

Imamura, Minoru: *See*—
Kamohara, Hideaki; Imamura, Minoru; Higaki, Hiroshi; Yoshitomi, Yuji; Uno, Syuzo; Makino, Kazuhiro; Nomura, Hiroshi; and Yoshioka, Kyozo, 4,489,659, Cl. 104-124.000.

Imperial Chemical Industries PLC: *See*—
Boulton, Thomas W., 4,490,231, Cl. 204-263.000.
Brittain, David R.; and Wood, Robin, 4,490,381, Cl. 424-273.00R.
Cooper, John; and Mumme-Young, Colin A., 4,490,194, Cl. 149-2.000.
Cooper, John; Reid, David S.; Mumme-Young, Colin A.; and Gregson, Robert D., 4,490,195, Cl. 149-2.000.
Cramp, John H. W., 4,490,043, Cl. 356-407.000.
Davies, Gwilym R.; and Williams, Alfred G., 4,490,222, Cl. 204-78.000.
Jung, Frederic H.; and Davies, Gareth M., 4,490,382, Cl. 424-270.000.

Imreg, Inc.: *See*—
Gottlieb, A. Arthur, 4,490,472, Cl. 436-504.000.

Inaba, Hajimu; and Torii, Nobutoshi, to Fujitsu Fanuc Limited. Workpiece feeder. 4,489,821, Cl. 198-472.000.

Inamasu, Masanori: *See*—
Ikezaki, Muneyoshi; Kanno, Takeshi; Iwai, Hajime; and Inamasu, Masanori, 4,490,392, Cl. 424-330.000.

Industra Products, Inc.: *See*—
Walker, Robert G., 4,489,764, Cl. 140-92.100.

Ing. C. Olivetti & C., S.p.A.: *See*—
Costa, Armando; and Verani, Giovanni, 4,489,931, Cl. 271-277.000.

Ing. h.c.F. Porsche AG: *See*—
Soederberg, Richard, 4,489,904, Cl. 244-75.00R.

Ingersoll-Rand Company: *See*—
Chaiko, Walter M., 4,490,074, Cl. 405-259.000.

Inman, Frank S., to Thiokol Corporation. Extendible nozzle exit cone. 4,489,889, Cl. 239-265.330.

Inomata, Masashi; Kon, Shizuo; Kaku, Tsukasa; and Shinohara, Shizuo, to Hoxan Corporation. X-Ray photographic inspecting device. 4,490,833, Cl. 378-58.000.

Inou, Masaaki: *See*—
Ohya, Masayuki; and Inou, Masaaki, 4,490,787, Cl. 364-200.000.

Inoue, Eiichi: *See*—
Shimizu, Isamu; Arao, Kozo; and Inoue, Eiichi, 4,490,450, Cl. 430-57.000.

Inoue, Soichi: *See*—
Oguri, Yasuo; Awata, Mitsuru; Saito, Junji; Inoue, Soichi; and Ariyama, Noriyuki, 4,490,320, Cl. 264-82.000.

Inoue, Tetsuzo: *See*—
Kawabata, Susumu; Inoue, Tetsuzo; Kurushima, Tadanori; and Kamiya, Kazuo, 4,489,547, Cl. 57-415.000.

Inoue, Toshio: *See*—
Kawabata, Juheiji; Inoue, Toshio; Sugie, Toshinori; and Kobata, Fumihiro, 4,490,522, Cl. 528-388.000.

Institut Elektrosvarki Imeni E.O. Patona Akademit Nauk Ukrainskoi SSR: *See*—
Kuchuk-Yatsenko, Sergei I.; Krivenko, Valery G.; Bogorsky, Mikhail V.; Lazebny, Ivan L.; Porkhun, Fedor K.; Sakharnov, Vasily A.; and Cherednichok, Vitaly T., 4,490,081, Cl. 409-300.000.

Institut Elektrosvarki Imeni E.O. Patona: *See*—
Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; and Galian, Boris A., 4,490,599, Cl. 219-61.100.

Institut Fiziki Akademii Nauk Estonskoi SSR: *See*—
Volynets, Filipp K.; Demidenko, Vladimir A.; Denisov, Roman A.; Denx, Viktor P.; Dydelzak, Alexandr E.; Ryzhikov, Engels N.; and Terentsieva, Evgenia A., 4,490,286, Cl. 252-583.000.

Intech Systems Corp.: *See*—
Slavin, Martin J., 4,489,610, Cl. 73-585.000.

Interad Systems, Inc.: *See*—
Peerenboom, B. David; and Sypal, Kenneth L., 4,490,614, Cl. 250-385.000.

International Business Machines Corporation: *See*—
Beck, Vernon D., 4,490,652, Cl. 315-366.000.
Bigbie, Samuel E.; Cavill, Barry R.; Dodgen, David F.; and Nawy, Albert A., 4,490,796, Cl. 364-519.000.
Bindra, Perminder S.; and Light, David N., 4,490,219, Cl. 204-23.000.
Blum, Arnold; and Schettler, Helmut, 4,490,673, Cl. 324-158.00R.
Champ, Robert B.; and Chen, Yau T., 4,490,452, Cl. 430-58.000.
Chen, Lee; Chuang, Tung J.; and Mathad, Gangadhara S., 4,490,210, Cl. 156-643.000.
Chen, Lee; Lankard, John R.; and Mathad, Gangadhara S., 4,490,211, Cl. 156-643.000.
Chevillat, Pierre R.; Kaser, Hans P.; Maiwald, Dietrich G. U.; and Ungerbock, Gottfried, 4,490,807, Cl. 364-736.000.
Conly, Douglas J.; Baker, Bonnie B.; Larson, David D.; and Riddle, Stanley T., 4,490,032, Cl. 355-14.00R.
Dixon, Jerry D.; Marazas, Gerald A.; and Merckel, Gerald U., 4,490,782, Cl. 364-200.000.
Dost, Martin H.; Liu, Chung C.; and Mueller, Francis E., 4,490,756, Cl. 360-77.000.
Findlay, Hugh T.; and Rood, Leonard M., 4,490,430, Cl. 428-217.000.
Freeman, Leo B., 4,490,630, Cl. 307-455.000.
Hasler, Werner; Padmanabhan, Subramaniam; and Staudenmaier, Klaus, 4,489,650, Cl. 101-93.140.
Hill, Murray K.; and McConnell, William H., 4,490,766, Cl. 360-137.000.
Horchos, Leonard A.; and Lorber, Harold W., 4,489,863, Cl. 222-504.000.
Ishaq, Mousa H.; Roberts, Stanley; and Ryan, James G., 4,490,193, Cl. 148-188.000.
Johnson, Carl F.; and Williams, James M., 4,490,055, Cl. 400-51.000.

International Flavors & Fragrances Inc.: *See*—
Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; Vock, Manfred H.; and Wiegers, Wilhelmus J., 4,490,404, Cl. 426-536.000.
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,490,544, Cl. 549-228.000.

International Paper Company: *See*—
Gordon, Robert L.; Maugle, George H.; and Cooper, Keith A., 4,489,537, Cl. 53-511.000.

International Resources Management, Inc.: *See*—
Coffing, Samuel F., 4,490,259, Cl. 210-704.000.

International Standard Electric Corporation: *See*—
Baumgaertner, Armin; and Elsaesser, Kurt, 4,490,451, Cl. 430-57.000.
Guenther, Horst H.; and Roesl, Wolfgang, 4,490,588, Cl. 200-11.00R.

International Telephone and Telegraph Corporation: *See*—
Bogan, Leonard E.; Knapke, Paul H.; and Miller, Robert L., 4,490,819, Cl. 370-84.000.
John, Robert S., 4,490,658, Cl. 318-484.000.
West, Michael D.; and Dean, Robert H., 4,489,915, Cl. 251-161.000.

Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Gani, Mohamed M.; May, Keith; and Porter, Philip, 4,490,290, Cl. 260-112.00B.

Internationale Octrooi Maatschappij "Octropa"B.V.: *See*—
Lok, Cornelis M.; Verzijl, Dirk; and van Dijk, Jacob, 4,490,480, Cl. 502-315.000.

Inventio AG: *See*—
Haas, Max, 4,489,527, Cl. 52-217.000.

Invention Development Equity Associates, Inc.: *See*—
Epperson, Charles N., 4,489,839, Cl. 215-10.000.

Iqbal, Abul; and Cassar, Luigi, to Ciba-Geigy Corporation. 1,4-Diketopyrrolo[3,4-c]pyrroles. 4,490,542, Cl. 548-453.000.

Irie, Soichiro: *See*—
Kawaguchi, Yasushi; Mine, Kiyomitsu; Ide, Keiko; Yamashita, Yukie; Irie, Soichiro; and Hirao, Yotaro, 4,490,462, Cl. 430-543.000.

Ironsite Products Co., Inc.: *See*—
Smith, Jeffrey G., 4,489,594, Cl. 73-49.700.

Irvine Sensors Corporation: *See*—
Carlson, Randolph S., 4,490,626, Cl. 307-243.000.

Irwin Measuring Tool Company: *See*—
Duda, Werner, 4,489,494, Cl. 33-138.000.

Isaka, Yoshiharu; and Hosoi, Yukiharu, to Yamaha Hatsudoki Kabushiki Kaisha. Exhaust system for motorcycles. 4,489,802, Cl. 180-219.000.

Isenberg, Arnold O., to Westinghouse Electric Corp. High temperature solid electrolyte fuel cell configurations and interconnections. 4,490,444, Cl. 429-31.000.

Ishaq, Mousa H.; Roberts, Stanley; and Ryan, James G., to International Business Machines Corporation. Method for making diffusions into a substrate and electrical connections thereto using rare earth boride materials. 4,490,193, Cl. 148-188.000.

Ishibashi, Yasumasa: *See*—
Shiohata, Kouki; Fujisawa, Fumio; Watanabe, Takashi; and Ishibashi, Yasumasa, 4,489,606, Cl. 73-462.000.

Ishida, Osami: *See*—
Takeda, Fumio; Ishida, Osami; and Isoda, Yoji, 4,490,696, Cl. 333-137.000.

Ishida, Tsuyoshi; Osawa, Hideo; and Naruse, Kazuaki. Pattern discriminating apparatus. 4,490,846, Cl. 382-7.000.

Ishiguro, Ken: *See*—
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Ishiguro, Ken; Nagai, Koichi; and Hata, Kunio, 4,490,435, Cl. 428-341.000.

Ishihara, Naoki. Air flow adjusting mechanism for hand held hot air hair dryer. 4,490,602, Cl. 219-370.000.

Ishihara Sangyo Kaisha Ltd.: *See*—
Fujikawa, Kanichi; Tsujii, Yasuhiro; Shigehara, Itaru; Isogai, Tatsuo; Yoshizawa, Hiroshi; and Miyaji, Mikio, 4,490,534, Cl. 546-345.000.

Isoda, Yoji: *See*—
Takeda, Fumio; Ishida, Osami; and Isoda, Yoji, 4,490,696, Cl. 333-137.000.

Isogai, Tatsuo: *See*—
Fujikawa, Kanichi; Tsujii, Yasuhiro; Shigehara, Itaru; Isogai, Tatsuo; Yoshizawa, Hiroshi; and Miyaji, Mikio, 4,490,534, Cl. 546-345.000.

Isolite Babcock Refractories, Co., Ltd.: *See*—
Nakagami, Kashiro, 4,489,473, Cl. 29-451.000.

Ito, Akitoshi: *See*—
Sakano, Hajime; Ito, Akitoshi; Yano, Motoichi; and Honda, Yasuhiro, 4,490,506, Cl. 525-67.000.

Ito, Kyle K.: *See*—
Hackett, Walter J.; and Ito, Kyle K., 4,490,270, Cl. 252-106.000.

Ito, Ren: *See*—
Maekawa, Iwao; Omori, Eiji; Uchigasaki, Isao; Tobita, Hideyuki; Yokoyama, Naoki; Tanno, Seikichi; Nakano, Fumio; and Ito, Ren, 4,490,496, Cl. 524-317.000.

Ito, Shigeyuki; and Watatani, Yoshizumi, to Hitachi, Ltd. Audio signal recording and reproducing circuit. 4,490,753, Cl. 360-19.100.
Ito, Susumu, to Nippon Electric Co., Ltd. Rotational angle detection device having two magnetoresistive sensing elements. 4,490,674, Cl. 324-208.000.
Ito, Yoshifumi; Yanagi, Kenichi; Shinoda, Naoharu; and Higaki, Seiji, to Mitsubishi Jukogyo Kabushiki Kaisha. Pillared structure of gas-treating apparatus. 4,490,161, Cl. 55-181.000.
Ito, Yoshiyasu; Suematsu, Toshio; Takeda, Yuji; Anzai, Katsushi; and Yoshida, Matsuji, to Toyota Jidosha Kabushiki Kaisha. Control for idle speed control valve. 4,489,688, Cl. 123-339.000.
Ito, Yukio: *See*—
Takeuchi, Hiroshi; Jyo mura, Shigeru; Nagatsuma, Kazuyuki; Hikita, Mitsutaka; Ito, Yukio; and Ashida, Sakichi, 4,490,641, Cl. 310-366.000.
Itoh, Hiroshi: *See*—
Kobayashi, Nobuyuki; Itoh, Hiroshi; and Hattori, Takashi, 4,489,696, Cl. 123-493.000.
ITT Industries, Inc.: *See*—
Andrei-Alexandru, Marcel; and Prohaska, Hans, 4,489,599, Cl. 73-146.500.
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Steffes, Helmut; Bleckmann, Hans-Wilhelm; Goosens, Andre F. L.; van Kelst, Willi; and Weise, Lutz, 4,489,989, Cl. 303-92.000.
Deimel, Helmut; and Schulein, Rolf G., 4,489,457, Cl. 15-41.00R.
Scovell, Peter D., 4,490,182, Cl. 148-1.500.
Scovell, Peter D., 4,490,183, Cl. 148-1.500.
Ivashenko, Alexandr V.: *See*—
Grebenkin, Mikhail F.; Ivashenko, Alexandr V.; Karamysheva, Ljudmila A.; Blinov, Lev M.; Kovshev, Evgeny I.; Shtykov, Nikolai M.; Titov, Viktor V.; Shoshin, Vadim M.; Agafonova, Irina F.; and Barnik, Mikhail I., 4,490,277, Cl. 252-299.600.
Ives, David C.; Miller, David K.; and Stecly, Simon, Jr. High-speed data transfer unit for digital data processing system. 4,490,784, Cl. 364-200.000.
Iwai, Hajime: *See*—
Ikezaki, Muneyoshi; Kanno, Takeshi; Iwai, Hajime; and Inamasu, Masanori, 4,490,392, Cl. 424-330.000.
Iwai, Tadashi; Mizuno, Hisayuki; and Miura, Masao, to UBE Industries, Ltd. Production process of silicon tetrachloride. 4,490,344, Cl. 423-341.000.
Iwasaki Tsushinki Kabushiki Kaisha: *See*—
Doi, Akiho; and Saneyoshi, Norio, 4,490,820, Cl. 370-100.000.
Iwata, Toshiharu: *See*—
Haraguchi, Hiroshi; Narita, Kou; Iwata, Toshiharu; and Baba, Yasutoshi, 4,489,692, Cl. 123-425.000.
Iwatani Sangyo Kabushiki Kaisha: *See*—
Mizuno, Tsutomu; and Kusaka, Hiroyuki, 4,490,348, Cl. 423-645.000.
Izawa, Akira: *See*—
Honda, Makoto; Izawa, Akira; and Moriguchi, Yutaro, 4,490,010, Cl. 350-128.000.
Izumi, Eiki: *See*—
Watanabe, Hiroshi; and Izumi, Eiki, 4,489,551, Cl. 60-328.000.
Watanabe, Hiroshi; and Izumi, Eiki, 4,489,552, Cl. 60-389.000.
Izumo, Takaharu: *See*—
Shindow, Kenji; Uenaka, Akimitsu; Izumo, Takaharu; Fujishima, Teruyoshi; and Yamamoto, Satoshi, 4,490,417, Cl. 427-388.300.
J. I. Case Company: *See*—
Fralish, Mark R., 4,489,539, Cl. 56-400.020.
Jackson, Francis W. Multiple piston expansion chamber engine. 4,489,681, Cl. 123-52.00B.
Jaeger: *See*—
Pompei Katz de Warrens, Jean, 4,490,024, Cl. 350-363.000.
Jaegfeldt, Hans Å.: *See*—
Gorton, Lo G.; Jaegfeldt, Hans Å.; Torstensson, Arne B.; and Johansson, Gillis R., 4,490,464, Cl. 435-4.000.
James, Alan D.; and Senior, Roy, to Akzona Incorporated. Anticaking compositions for treating hygroscopic or water-soluble material in particulate form. 4,490,281, Cl. 252-382.000.
James L. Taylor Mfg. Co.: *See*—
Mortoly, John L., 4,489,925, Cl. 269-71.000.
Janecka, Jerry F.: *See*—
Lockett, James F.; Smither, Miles A.; and Janecka, Jerry F., 4,490,606, Cl. 250-227.000.
Janssen Pharmaceutica N.V.: *See*—
Heeres, Jan; and Backx, Leo J. J., 4,490,530, Cl. 544-370.000.
Heeres, Jan; and Van der Veken, Louis J. E., 4,490,540, Cl. 548-336.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Abe, Mitsuo; Nagai, Hisao; and Kamiya, Akira, 4,490,507, Cl. 525-263.000.
Kawakami, Masato; and Tai, Seiji, 4,490,436, Cl. 428-403.000.
Jaquay, Louis H.; and Mengon, Albert C., deceased (by Mengon, Mary A., administratrix), to Dravo Corporation. Process for recovering heat from the combustion of residual carbon in oil depleted shale. 4,490,237, Cl. 208-11.00R.
Jarman, Trevor R.; and Hacking, Andrew J., to Kelco Biospecialties Ltd. Polysaccharide production using novel strains of *Pseudomonas mendocina*. 4,490,467, Cl. 435-101.000.
Jasmin, Gilles, to Hydro Quebec. Electronic simulator for the simulation of a hydro-turbine. 4,490,808, Cl. 364-802.000.
Jean Walterscheid GmbH: *See*—
Konrad, Mathias; Herchenbach, Paul; and Kampf, Klaus, 4,490,125, Cl. 464-11.000.
Jeco Co., Ltd.: *See*—
Mori, Toshihiro; Imai, Yoshifumi; Matsui, Masanori; and Masumura, Masao, 4,490,768, Cl. 361-2.000.
Jeffries, Phillip R.: *See*—
Dauben, William G.; Jeffries, Phillip R.; and Phillips, Richard B., 4,490,226, Cl. 204-159.000.
Jerrold, Laurance E.: *See*—
Cipollina, John J.; and Jerrold, Laurance E., 4,490,616, Cl. 250-515.100.
Jessup, Peter: *See*—
Holstedt, Richard A.; and Jessup, Peter, 4,490,265, Cl. 252-47.500.
Jingu, Masaharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic transducer probe. 4,489,730, Cl. 128-660.000.
Jochem, Cornelis M. G.; Khoe, Giok D.; and Nicia, Antonius J. A., to U.S. Philips Corporation. Method of manufacturing a fiber-optical coupling element. 4,490,163, Cl. 65-4.210.
Johansson, Gillis R.: *See*—
Gorton, Lo G.; Jaegfeldt, Hans Å.; Torstensson, Arne B.; and Johansson, Gillis R., 4,490,464, Cl. 435-4.000.
John, Robert S., to International Telephone and Telegraph Corporation. Circuit for automatically sequencing a valve mechanism. 4,490,658, Cl. 318-484.000.
Johnson, Carl F.; and Williams, James M., to International Business Machines Corporation. Automatically adjustable delay function for timed typamatic. 4,490,055, Cl. 400-51.000.
Johnson, Craig N.: *See*—
Konzal, Daryl R.; Johnson, Craig N.; and Baumgartner, Donald W., 4,490,130, Cl. 493-106.000.
Johnson, Reginald S.: *See*—
Kopsho, Joseph D., Jr.; Suszynski, Edward D.; and Johnson, Reginald S., 4,490,710, Cl. 338-128.000.
Johnson, Robert W., to United Conveyor Corporation. Combined settling and liquid storage tank. 4,490,255, Cl. 210-256.000.
Johnson, Roy A., to Upjohn Company, The. Pyridyl-substituted-benzofurans. 4,490,531, Cl. 546-269.000.
Johnson, Roy A., to Upjohn Company, The. Enlarged-hetero-ring prostacyclin analogs. 4,490,537, Cl. 548-252.000.
Johnson, Roy A., to Upjohn Company, The. Enlarged-hetero-ring prostacyclin analogs. 4,490,538, Cl. 548-252.000.
Johnson, Roy A., to Upjohn Company, The. Enlarged-hetero-ring prostacyclin analogs. 4,490,548, Cl. 544-396.000.
Johnson, Roy A., to Upjohn Company, The. Enlarged-hetero-ring prostacyclin analogs. 4,490,549, Cl. 549-396.000.
Johnson, Thomas J.: *See*—
Tsai, Lung-Wen; and Johnson, Thomas J., 4,489,683, Cl. 123-192.00B.
Johnston, Christian W.: *See*—
Gould, Francis E.; and Johnston, Christian W., 4,490,423, Cl. 428-36.000.
Johnston, Robert W. Electronic programmable multiple alarm timing device and record. 4,490,711, Cl. 340-309.400.
Jones, Gary W., to Texas Instruments Incorporated. Insulator and metallization method for VLSI devices with anisotropically-etched contact holes. 4,489,481, Cl. 29-591.000.
Jones, Gordon H.; Venuti, Michael C.; Alvarez, Robert; and Bruno, John J., to Syntex (U.S.A.) Inc. N,N-Disubstituted-(2-oxo-1,2,3,5-tetrahydroimidazo-[2,1-B]quinazolinyl)oxyalkylamides. 4,490,371, Cl. 424-248.540.
Jones, Howard: *See*—
Loev, Bernard; Brown, Richard E.; Huang, Pu-chih; and Jones, Howard, 4,490,373, Cl. 424-250.000.
Jones, Joseph M. Oral sound analysis method and apparatus for determining voice, speech and perceptual styles. 4,490,840, Cl. 381-48.000.
Jones, Kermit M., Jr.: *See*—
Asick, John C.; Douty, George H.; Goodman, Joseph R.; Jones, Kermit M., Jr.; Landis, John M.; Snyder, Clair W., Jr.; Woratyla, John A.; and Zell, Dale R., 4,489,998, Cl. 339-17.0LM.
Jones, William R. Hot zone chamber wall arrangement for use in vacuum furnaces. 4,489,920, Cl. 266-283.000.
Jones, William R. Plenum arrangement. 4,490,110, Cl. 432-205.000.
Jong, Kenneth, to AT&T Bell Laboratories. Balanced modulator using logic gates for DSBSC output. 4,490,689, Cl. 332-31.00T.
Jordan, Stanley J., to Minnesota Mining and Manufacturing Company. Reinforced pavement-marking sheet material. 4,490,432, Cl. 428-220.000.
Joshi, David P.; and Divone, Peter A., to Colgate-Palmolive Company. Process for manufacturing translucent antibacterial soap. 4,490,280, Cl. 252-368.000.
Jost, Manfred: *See*—
Knoke, Jurgen; Jost, Manfred; Tecl, Bohuslav; and Fahrbach, Erich, 4,490,425, Cl. 428-90.000.
Joy Manufacturing Company: *See*—
Kendrick, Frank B., 4,489,985, Cl. 299-80.000.
Jujo Paper Co., Ltd.: *See*—
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Harada, Kazuo; and Konno, Takeo, 4,490,434, Cl. 428-341.000.
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Ishiguro, Ken; Nagai, Koichi; and Hata, Kunio, 4,490,435, Cl. 428-341.000.
Jung, Frederic H.; and Davies, Gareth M., to Imperial Chemical Industries PLC; and ICI Pharma. Penicillin derivatives. 4,490,382, Cl. 424-270.000.
Jungkind, Roland, to Marker Patentvertwertungsgeselischaft mbH. Heelholder for safety ski bindings. 4,489,956, Cl. 280-632.000.
Junkosha Company, Ltd.: *See*—
Suzuki, Hirosuki, 4,490,690, Cl. 333-1.000.

Justrite Manufacturing Company: *See*—
Flider, Frank S., 4,489,860, Cl. 222-189.000.

Jyo mura, Shigeru: *See*—
Takeuchi, Hiroshi; Jyo mura, Shigeru; Nagatsuma, Kazuyuki; Hikita, Mitsutaka; Ito, Yukio; and Ashida, Sakichi, 4,490,641, Cl. 310-366.000.

Kabdebo, Otto Z.: *See*—
Failor, Raymond A.; and Kabdebo, Otto Z., 4,489,449, Cl. 5-86.000.

Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho: *See*—
Yokoyama, Tohei, 4,490,601, Cl. 219-69.00R.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nagai, Shunichi; and Hiramura, Kazuo, 4,489,578, Cl. 72-21.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Tanaka, Susumu; Daisaku, Takehiko; and Suda, Yoshihide, 4,490,112, Cl. 433-20.000.

Kabushiki Kaisha Takeuchi Sangyo: *See*—
Mogi, Toshio, 4,490,757, Cl. 360-94.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Hasegawa, Junzo; Kawabata, Susumu; Horiuchi, Mitsunori; and Suzuki, Yoshihisa, 4,489,461, Cl. 19-258.000.
Kawabata, Susumu; Inoue, Tetsuzo; Kurushima, Tadanori; and Kamiya, Kazuo, 4,489,547, Cl. 57-415.000.
Morita, Takayuki; and Tsunekawa, Takahiko, 4,489,544, Cl. 57-261.000.
Susumu, Kawabata; Hiroshi, Niimi; Meiji, Anahara; and Hiroshi, Omori, 4,489,545, Cl. 57-333.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kawabata, Susumu; Inoue, Tetsuzo; Kurushima, Tadanori; and Kamiya, Kazuo, 4,489,547, Cl. 57-415.000.
Susumu, Kawabata; Hiroshi, Niimi; Meiji, Anahara; and Hiroshi, Omori, 4,489,545, Cl. 57-333.000.

Kabushiki Kaisha Velonar: *See*—
Mineshima, Makoto, 4,490,031, Cl. 354-402.000.

Kabushiki Kaisha Wefwod: *See*—
Mogi, Toshio, 4,490,757, Cl. 360-94.000.

Kadija, Igor V.; and Oxley, James E., to Olin Corporation. Process and apparatus for producing surface treated metal foil. 4,490,218, Cl. 204-13.000.

Kai, Tomokazu; and Tsuboi, Toshihide, to Nippon Electric Co., Ltd. Radio signal transmission system including a plurality of transmitters for transmitting a common signal. 4,490,830, Cl. 375-40.000.

Kajitani, Tamotsu: *See*—
Kawarada, Hiroshi; Tatsumichi, Toshio; Wakahata, Yasuo; Hamanaka, Mitsuyoshi; and Kajitani, Tamotsu, 4,490,015, Cl. 350-340.000.

Kajiya, Seitaro: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Minami, Tamotsu; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,490,393, Cl. 424-263.000.

Kajiyama, Ryuichi: *See*—
Yonemoto, Masashi; and Kajiyama, Ryuichi, 4,489,811, Cl. 187-29.00R.

Kaku, Tsukasa: *See*—
Inomata, Masashi; Kon, Shizuo; Kaku, Tsukasa; and Shinohara, Shizuo, 4,490,833, Cl. 378-58.000.

Kakuyama, Shinji: *See*—
Kono, Takashi; Kakuyama, Shinji; and Kamai, Toshimitsu, 4,490,751, Cl. 358-330.000.

Kalina, Alexander I. Generation of energy. 4,489,563, Cl. 60-673.000.

Kalsi, Manmohan S. Nonfloating seat for expanding gate valves. 4,489,918, Cl. 251-328.000.

Kalvaitis, Arvydas J.: *See*—
Beebe, Emmett R.; Dixon, Edmund S.; and Kalvaitis, Arvydas J., 4,489,966, Cl. 292-334.000.

Kamai, Toshimitsu: *See*—
Kono, Takashi; Kakuyama, Shinji; and Kamai, Toshimitsu, 4,490,751, Cl. 358-330.000.

Kamath, Bantval Y., to Ampex Corporation. Method and apparatus for one line dropout compensation of color television signals. 4,490,748, Cl. 358-314.000.

Kamijo, Ken, to Nissan Motor Company, Limited. Strap retractor assembly. 4,489,804, Cl. 180-268.000.

Kamimoto, Shigemi: *See*—
Ueda, Kohichi; Kamimoto, Shigemi; and Miyata, Akira, 4,490,809, Cl. 364-900.000.

Kaminaka, Nobuyuki; Kanai, Kenji; and Nomura, Noboru, to Matsushita Electric Industrial Co., Ltd. Thin-film magnetic head. 4,490,760, Cl. 360-126.000.

Kamino, Yukishige: *See*—
Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,490,044, Cl. 366-17.000.
Wyatt, Philip J.; Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,490,042, Cl. 356-340.000.

Kamiya, Akira: *See*—
Abe, Mitsuo; Nagai, Hisao; and Kamiya, Akira, 4,490,507, Cl. 525-263.000.

Kamiya, Kazuo: *See*—
Kawabata, Susumu; Inoue, Tetsuzo; Kurushima, Tadanori; and Kamiya, Kazuo, 4,489,547, Cl. 57-415.000.

Kamiyama, Shuichi; and Okada, Yoji, to Mikuni Kogyo Kabushiki Kaisha. Device for driving a stepping motor. 4,490,663, Cl. 318-696.000.

Kamohara, Hideaki; Imamura, Minoru; Higaki, Hiroshi; Yoshitomi, Yuji; Uno, Syuzo; Makino, Kazuhiro; Nomura, Hiroshi; and Yoshioka, Kyozo, to Hitachi, Ltd. Truss-type girder for supporting a movable body. 4,489,659, Cl. 104-124.000.

Kampf, Klaus: *See*—
Konrad, Mathias; Herchenbach, Paul; and Kampf, Klaus, 4,490,125, Cl. 464-11.000.

Kan, Peter: *See*—
Meyer, Richard C.; and Kan, Peter, 4,490,665, Cl. 318-696.000.

Kanai, Kenji: *See*—
Kaminaka, Nobuyuki; Kanai, Kenji; and Nomura, Noboru, 4,490,760, Cl. 360-126.000.

Kanbe, Junichiro: *See*—
Misumi, Teruo; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Shirai, Shigeru, 4,490,454, Cl. 430-84.000.
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,490,453, Cl. 430-65.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Yokota, Kenichi; Nishita, Shigeo; and Sakauchi, Takashi, 4,490,498, Cl. 524-371.000.

Kanno, Takeshi: *See*—
Ikezaki, Muneyoshi; Kanno, Takeshi; Iwai, Hajime; and Inamasu, Masanori, 4,490,392, Cl. 424-330.000.

Kano, Isao: *See*—
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Harada, Kazuo; and Konno, Takeo, 4,490,434, Cl. 428-341.000.
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Ishiguro, Ken; Nagai, Koichi; and Hata, Kunio, 4,490,435, Cl. 428-341.000.

Kappler, Fritz-Robert: *See*—
Glembin, Dirk; Kappler, Fritz-Robert; Curatolo, Luigi; and Trapani, Vittorio, 4,490,343, Cl. 423-336.000.

Karamysheva, Ljudmila A.: *See*—
Grebenkin, Mikhail F.; Ivashenko, Alexandr V.; Karamysheva, Ljudmila A.; Blinov, Lev M.; Kovshev, Evgeny I.; Shtykov, Nikolai M.; Titov, Viktor V.; Shoshin, Vadim M.; Agafonova, Irina F.; and Barnik, Mikhail I., 4,490,277, Cl. 252-299.600.

Kardashian, Vahram S.; and Benson, Richard D., to Honeywell Inc. Cold/dry substrate treatment technique which improves photolithographic limits of resolution and exposure tolerance. 4,490,457, Cl. 430-311.000.

Kassabian, George, to Garrett Corporation, The. Gas generator with ratchet no-back and method. 4,489,549, Cl. 60-39.020.

Kasai, Taketsugu: *See*—
Suzuki, Tomio; Tamura, Setsuo; Tanaka, Kozo; Hirose, Ryoichi; Komatsu, Hiroyuki; Tamada, Shinichi; Kasai, Taketsugu; and Tanimoto, Keisuke, 4,490,171, Cl. 75-42.000.

Kaschube, Karl-Friedrich: *See*—
Braudenstein, Manfred; Ernst, Horst M.; Walter, Lothar; and Kaschube, Karl-Friedrich, 4,489,992, Cl. 384-496.000.

Kaser, Hans P.: *See*—
Cnevillat, Pierre R.; Kaser, Hans P.; Maiwald, Dietrich G. U.; and Ungerbock, Gottfried, 4,490,807, Cl. 364-736.000.

Kashiwa, Norio: *See*—
Minami, Syuji; Toyota, Akinori; and Kashiwa, Norio, 4,490,513, Cl. 526-128.000.

Kassat, Harry; Wirth, Friedrich; and Wagner, Joachim, to BASF Aktiengesellschaft. Desublimator for isolating sublimation products from reaction gases. 4,489,775, Cl. 165-67.000.

Kataoka, Tadashi; and Hiyama, Hirokuni, to Ebara Corporation. Mechanical seal. 4,489,951, Cl. 277-83.000.

Kato Hatsujo Kaisha, Limited: *See*—
Matsui, Tatsuhiko; Aida, Hiroyuki; and Ohnuki, Tomoyoshi, 4,489,967, Cl. 292-339.000.

Kato, Kazuo: *See*—
Shimba, Satoru; Watanabe, Yoshikazu; Kato, Kazuo; and Yamashita, Kiyotoshi, 4,490,460, Cl. 430-504.000.

Kato, Masaaki, to Nippondenso Co., Ltd. Fuel injection apparatus. 4,489,886, Cl. 239-88.000.

Kato, Osamu: *See*—
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, 4,490,239, Cl. 208-44.000.

Kato, Ryoki: *See*—
Sekimoto, Souichi; and Kato, Ryoki, 4,490,611, Cl. 250-316.100.

Katryniok, Detlef: *See*—
Ruch, Jean; and Katryniok, Detlef, 4,490,443, Cl. 429-27.000.

Katsube, Seiichi: *See*—
Yamamoto, Hideo; and Katsube, Seiichi, 4,489,708, Cl. 126-362.000.

Katz, Otto, to A.W. Faber-Castell. Writing instrument for automatic advancement and feed of leads. 4,490,061, Cl. 401-53.000.

Katz, Thomas J., to United States of America, Navy. Olefin metathesis. 4,490,512, Cl. 526-75.000.

Kaufman, Benjamin J., to Texaco Inc. Mannich reaction products of diaminopropanes with formaldehyde and salicyclic acids. 4,490,155, Cl. 44-71.000.

Kawabata, Juheiji; Inoue, Toshio; Sugie, Toshinori; and Kobata, Fumihiro, to Dainippon Ink & Chemicals, Inc. Process for producing polyphenylene sulfide. 4,490,522, Cl. 528-388.000.

Kawabata, Susumu; Inoue, Tetsuzo; Kurushima, Tadanori; and Kamiya, Kazuo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Fiber control apparatus in open end spinning frame. 4,489,547, Cl. 57-415.000.

Kawabata, Susumu: *See*—
Hasegawa, Junzo; Kawabata, Susumu; Horiuchi, Mitsunori; and Suzuki, Yoshihisa, 4,489,461, Cl. 19-258.000.

Kawada, Shosaku, to Nakanishi Dental Mfg. Co., Ltd. Dental handpiece. 4,490,113, Cl. 433-104.000.

Kawaguchi, Yasushi; Mine, Kiyomitsu; Ide, Keiko; Yamashita, Yukie; Irie, Soichiro; and Hirao, Yotaro, to Konishiroku Photo Industry Co.,

Ltd. Light-sensitive silver halide photographic material. 4,490,462, Cl. 430-543.000.

Kawai, Hisasi: *See*—
Kohama, Tokio; Huzino, Seizi; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,489,695, Cl. 123-481.000.

Kawai Musical Instruments Mfg. Co., Ltd: *See*—
Deutsch, Ralph, 4,489,637, Cl. 84-1.220.

Kawai, Tsuneo, to Tokyo Shibaura Denki Kabushiki Kaisha. Drying apparatus. 4,489,507, Cl. 34-77.000.

Kawakami, Masato; and Tai, Seiji, to Japan Synthetic Rubber Co., Ltd. Polymer filler particles with filler free coating. 4,490,436, Cl. 428-403.000.

Kawamata, Yutaka; and Matsuo, Akira, to Mitsubishi Light Metal Industries Limited. Method of resetting anode spike. 4,490,826, Cl. 373-97.000.

Kawamura, Hideo: *See*—
Kusanagi, Shigekazu; Akiyama, Shigeo; Nobutani, Tohru; and Kawamura, Hideo, 4,490,715, Cl. 340-634.000.

Kawarada, Hiroshi; Tatsumichi, Toshio; Wakahata, Yasuo; Hamanaka, Mitsuyoshi; and Kajitani, Tamotsu, to Matsushita Electric Industrial Co., Ltd. Liquid crystal color display panel. 4,490,015, Cl. 350-340.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujikawa, Tetsuzo; Hirata, Makizo; and Tamba, Shinichi, 4,490,309, Cl. 261-52.000.

Kawashima, Motozo: *See*—
Takeshima, Takahiko; Ueki, Tadashi; Kawashima, Motozo; Ueno, Thuneo; and Nishimoto, Masayuki, 4,489,771, Cl. 164-305.000.

Kawatei, Hisatsugu, to Diesel Kiki Co., Ltd. Distributor type fuel injection pump having a starting injection timing advance device. 4,489,697, Cl. 123-502.000.

Kawazura, Hiroshi: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Minami, Tamotsu; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,490,393, Cl. 424-263.000.

Kazawa, Yoshiaki: *See*—
Suzuki, Shohei; Kazawa, Yoshiaki; Saito, Ryusei; Noguchi, Koji; Moriai, Hidezumi; Mashiko, Ryoichi; and Sakai, Shuji, 4,490,578, Cl. 174-15.00S.

Kazushige, Hayashi: *See*—
Shigeru, Futami; Koji, Tajiri; and Kazushige, Hayashi, 4,490,433, Cl. 428-262.000.

Kebanli, Ertugrul S., to Procter & Gamble Company, The. Heavy-duty liquid detergent composition. 4,490,285, Cl. 252-551.000.

Keck, Johannes: *See*—
Reiffen, Manfred; Heider, Joachim; Hauel, Norbert; Austel, Volkhard; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Noll, Klaus; Pieper, Helmut; Kruger, Gerd; and Keck, Johannes, 4,490,369, Cl. 424-244.000.

Keefe, Howard W.: *See*—
Moore, Robert G.; Simpson, Anthony Y.; and Keefe, Howard W., 4,489,667, Cl. 114-67.00A.

Kehl, Joseph D., to Shure Brothers, Inc. Tonearm alignment gauge. 4,490,816, Cl. 369-55.000.

Kelco Biospecialties Ltd.: *See*—
Jarman, Trevor R.; and Hacking, Andrew J., 4,490,467, Cl. 435-101.000.

Kelly, Ronald W.: *See*—
Thompson, Paige W.; and Kelly, Ronald W., 4,490,708, Cl. 337-320.000.

Kempel, John J., to Garland Manufacturing Co. Adjustable hinge construction including spring clips for prefab door and jamb assemblies. 4,489,459, Cl. 16-248.000.

Kendall Company, The: *See*—
Sergeant, Timothy L., 4,490,146, Cl. 604-358.000.
Steigerwald, Carl J., 4,490,144, Cl. 604-323.000.

Kendrick, Frank B., to Joy Manufacturing Company. Cutter drum extension latching mechanism. 4,489,985, Cl. 299-80.000.

Kennecott Corporation: *See*—
Staten, Walter T., 4,490,474, Cl. 501-115.000.

Kenny, James E., to S.E.C.A. Societe Anonyme, Societe d'Entreprises Commerciales et Aeronautiques. Linear movement motor and a swash plate for a motor of this type. 4,489,682, Cl. 123-58.00B.

Kent, Willie D. Tennis racket and string aligner therefor. 4,489,942, Cl. 273-73.00R.

Kerfoot, O. Carl: *See*—
Yang, Kang; Starks, Charles M.; and Kerfoot, O. Carl, 4,490,561, Cl. 568-615.000.

Kerpel-Fronius, Sandor: *See*—
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Honty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos, 4,490,378, Cl. 424-262.000.

Kessler, Harry H.: *See*—
Moore, William H.; and Kessler, Harry H., 4,490,172, Cl. 75-58.000.

Keve, Tibor: *See*—
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Honty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos, 4,490,378, Cl. 424-262.000.

Keyser, A. Lynn. Color card pack. 4,489,948, Cl. 273-306.000.

Keyser, Thomas; Thomas, Michael E.; Pierce, John M.; and Cleeves, James M., to Fairchild Camera & Instrument Corp. Impregnation of aluminum interconnects with copper. 4,489,482, Cl. 29-591.000.

Kezran, Mitchell, to Precision Industries, Inc. Hole cutting tool. 4,490,080, Cl. 408-68.000.

Khan, Ashfaq R.: *See*—
Edwards, Ivan L.; Macrander, Max S.; and Khan, Ashfaq R., 4,490,581, Cl. 179-18.0EE.

Khoe, Giok D.: *See*—
Jochem, Cornelis M. G.; Khoe, Giok D.; and Nicia, Antonius J. A., 4,490,163, Cl. 65-4.210.

Khudosovtseva, Galina P.: *See*—
Maslyaev, Viktor S.; Sagalovsky, Evgeny S.; Khudosovtseva, Galina P.; Gorovets, Petr M.; Filimonova, Ljudmila Y.; and Zborschik, Ljubov A., 4,490,274, Cl. 252-186.220.

Kidd, Patrick D.: *See*—
Orlowski, Jan A.; Butler, David V.; and Kidd, Patrick D., 4,490,115, Cl. 433-199.000.

Kidde Recreation Products, Inc.: *See*—
Meyer, Leonard S.; Murray, Michael J.; Hayes, Gerald G.; and McClain, Robert L., 4,489,876, Cl. 228-170.000.

Kikuchi, Tatsuji: *See*—
Miyauchi, Terukatsu; Ikeda, Yoneichi; and Kikuchi, Tatsuji, 4,490,243, Cl. 208-127.000.

Kimberly-Clark Corporation: *See*—
Mattina, Charles F., Jr.; and Selke, William A., 4,489,739, Cl. 131-352.000.

Kimmelaar, Rudolf J. A., to Cincinnati Milacron Inc. Machine tool bearing system. 4,490,054, Cl. 384-117.000.

Kimura, Kensaku; and Watanabe, Toshio, to Kurosaki Furnace Industries Company Limited; and Kurosaki Refractries Company Limited. Method of processing charges in a continuous combustion furnace. 4,490,107, Cl. 432-11.000.

Kimura, Makoto, to Eisai Co., Ltd. Quality improver for animal fur. 4,490,359, Cl. 424-93.000.

Kingston, Samuel B.: *See*—
Webb, Terence C.; Lovell, Peter A.; and Kingston, Samuel B., 4,490,461, Cl. 430-510.000.

Kino Precision Industries, Ltd.: *See*—
Yokotsuka, Akio, 4,490,018, Cl. 350-429.000.

Kinoshita, Mitsutaka; Nakagami, Tatsuro; Murakami, Nobuaki; Endo, Norio; Tamura, Fumio; and Danno, Yoshiaki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Multi-cylinder internal combustion engine. 4,489,685, Cl. 123-198.00F.

Kipp, Robert M.; and Ayers, Ray R., to Shell Oil Company. Memory metal connector. 4,489,964, Cl. 285-374.000.

Kirby, Kevin D.; and Mardon, Christopher J., to Commonwealth Scientific and Industrial Research Organization. Production of ethanol by fermentation. 4,490,469, Cl. 435-161.000.

Kircher, Dieter: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Steffes, Helmut; Bleckmann, Hans-Wilheim; Goosens, Andre F. L.; van Kelst, Willi; and Weise, Lutz, 4,489,989, Cl. 303-92.000.

Kirchev, Nikolay A.: *See*—
Marev, Kiril S.; Krachanov, Hristo G.; Bratanov, Anton A.; and Kirchev, Nikolay A., 4,490,335, Cl. 422-269.000.

Kirsinas, Peter; Brouwer, John J.; Purpura, Richard M.; and Wiencek, Donald C., to Panduit Corp. Automatic wire joint installation tool. 4,489,589, Cl. 72-424.000.

Kishi, Hajimu; Seki, Masaki; Tanaka, Kunio; and Takegahara, Takashi, to Fujitsu Fanuc Limited. System and method for preparing numerical control information. 4,490,781, Cl. 364-191.000.

Kisler, Semyon, to Polaroid Corporation. Apparatus for coating semiconductive material. 4,489,672, Cl. 118-620.000.

Kitagawa, Hiroshi: *See*—
Yuki, Nakaji; and Kitagawa, Hiroshi, 4,490,160, Cl. 55-68.000.

Klapdor, Ute: *See*—
Amort, Jurgen; Hanisch, Horst; Klapdor, Ute; Suerken, Hans P.; and van der Maas, Hendrikus, 4,490,526, Cl. 536-102.000.

Kleesattel, Claus; and Warrin, George E., to Cooper LaserSonics, Inc. Ultrasonically driven low-speed rotary motor. 4,490,114, Cl. 433-105.000.

Klein, Erich: *See*—
Brunke, Ernst-Joachim; and Klein, Erich, 4,490,284, Cl. 252-522.00R.

Klein, Manfred: *See*—
Kuisl, Max; and Klein, Manfred, 4,490,678, Cl. 324-438.000.

Kleiner, Lothar W., to Mitech Corporation. Flame retardant thermoplastic molding compounds of high electroconductivity. 4,490,283, Cl. 252-512.000.

Klenk, Herbert, to Degussa Aktiengesellschaft. Process for the production of β-mercaptopropionic acid derivatives. 4,490,307, Cl. 260-465.100.

Kliewer, Aron, to Fleetwood Enterprises, Inc. Method and apparatus for manufacturing stress-skin panels. 4,490,317, Cl. 264-46.500.

Kling, Michael J.: *See*—
Marino, Joseph A.; Kling, Michael J.; Roth, Sydney J.; and Makhija, Surender K., 4,490,799, Cl. 364-551.000.

Klinkau & Co. GmbH: *See*—
Klinkau , Werner, 4,490,321, Cl. 264-109.000.

Klinkau , Werner, to Klinkau & Co. GmbH. Method and apparatus for manufacturing filter plates or the like. 4,490,321, Cl. 264-109.000.

Klinker, William J.: *See*—
Hsu, Jau Y.; Wedral, Elaine R.; and Klinker, William J., 4,490,396, Cl. 426-49.000.

Klomp, Edward D.; and Rask, Rodney B., to General Motors Corporation. Engine air inlet pressure measurement. 4,489,595, Cl. 73-115.000.
Kluch, Michael M. Collapsible rigid light box. 4,490,776, Cl. 362-16.000.
Klushin, Valery A.: *See*—
Davidovich, Alexandr N.; Schukin, Valery Y.; Klushin, Valery A.; Sadko, Vladimir I.; Skrebets, Nikolai M.; and Murashko, Evgeny T., 4,489,581, Cl. 72-70.000.
Kluth, Hans-Jurgen, to Licentia Patent-Verwaltungs-G.m.b.H. Video recorder with reduced audio interference. 4,490,754, Cl. 360-19.100.
Knapke, Paul H.: *See*—
Bogan, Leonard E.; Knapke, Paul H.; and Miller, Robert L., 4,490,819, Cl. 370-84.000.
Knips, Ulrich, to Rutgerswerke AG. Preparation of aryl esters by decomposing an aryl thallium carboxylate. 4,490,552, Cl. 560-130.000.
Knobel, Thomas M.: *See*—
Gurgiolo, Arthur E.; and Knobel, Thomas M., 4,489,913, Cl. 521-53.000.
Knoke, Jurgen; Jost, Manfred; Tecl, Bohuslav; and Fahrbach, Erich, to Carl Freudenberg, Firma. Fused and needled nonwoven interlining fabric. 4,490,425, Cl. 428-90.000.
Knoth, Werner-Dieter: *See*—
Nebelung, Hermann H.; and Knoth, Werner-Dieter, 4,490,164, Cl. 65-263.000.
Knuettel, Bertold; and Laukien, Gunther, to Bruker Analytische Messtechnik GmbH. Electromagnet for use in NMR tomography. 4,490,675, Cl. 324-319.000.
Kobata, Fumihiro: *See*—
Kawabata, Juheiji; Inoue, Toshio; Sugie, Toshinori; and Kobata, Fumihiro, 4,490,522, Cl. 528-388.000.
Kobayashi, Masashi, to Muruman Golf Kabushiki Kaisha. All-metallic golf club head. 4,489,945, Cl. 273-167.00H.
Kobayashi, Michiaki: *See*—
Takeuchi, Hideo; Kobayashi, Michiaki; Hashimoto, Hiroyuki; and Suzuki, Daiji, 4,489,652, Cl. 101-211.000.
Kobayashi, Nobuyuki; Itoh, Hiroshi; and Hattori, Takashi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling the fuel-feeding rate of an internal combustion engine. 4,489,696, Cl. 123-493.000.
Kobayashi, Takao: *See*—
Hirai, Yukio; Amagami, Keizo; Kobayashi, Takao; and Matsumoto, Shinichi, 4,490,596, Cl. 219-10.49R.
Kobe Steel, Limited: *See*—
Suzuki, Tomio; Tamura, Setsuo; Tanaka, Kozo; Hirose, Ryoichi; Komatsu, Hiroyuki; Tamada, Shinichi; Kasai, Taketsugu; and Tanimoto, Keisuke, 4,490,171, Cl. 75-42.000.
Kobinger, Walter: *See*—
Reiffen, Manfred; Heider, Joachim; Hauel, Norbert; Austel, Volkhard; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Noll, Klaus; Pieper, Helmut; Kruger, Gerd; and Keck, Johannes, 4,490,369, Cl. 424-244.000.
Koch, Marta: *See*—
Plaskura, Andrzej; Lachman, Ignacy; Byrka, Tadeusz; Leszczynski, Zbigniew; Rogalski, Krzysztof; Koch, Marta; and Zyczynski, Jozef, 4,490,310, Cl. 261-79.00A.
Kocide Chemical Corporation: *See*—
Richardson, Hugh W., 4,490,337, Cl. 423-43.000.
Koenig, Heribert: *See*—
Formanek, Lothar; Hirsch, Martin; Schnabel, Wolfram; Serbent, Harry; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Arlt, Detmar, 4,490,168, Cl. 75-10.00R.
Kohama, Tokio; Huzino, Seizi; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, to Nippon Soken, Inc. Method and system for output control of internal combustion engine. 4,489,695, Cl. 123-481.000.
Kohl, Vance L., to Manitowoc Company, Inc., The. Stackable water pressure ejection control ice cube maker. 4,489,567, Cl. 62-138.000.
Koji, Tajiri: *See*—
Shigeru, Futami; Koji, Tajiri; and Kazushige, Hayashi, 4,490,433, Cl. 428-262.000.
Kojima, Shigezo: *See*—
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hiroshi, 4,489,630, Cl. 83-15.000.
Kojima, Yutaka: *See*—
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Harada, Kazuo; and Konno, Takeo, 4,490,434, Cl. 428-341.000.
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Ishiguro, Ken; Nagai, Koichi; and Hata, Kunio, 4,490,435, Cl. 428-341.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Nakai, Taiichiro; Furusawa, Kahei; Sato, Masanori; Niiro, Yasuhiko; Ejiri, Yoshihiro; and Nunokawa, Makoto, 4,490,009, Cl. 350-96.230.
Sakaguchi, Haruo; Seki, Norio; and Yamamoto, Shu, 4,490,020, Cl. 350-96.180.
Kolb, Carl-Joachim: *See*—
Henseleit, Roland; and Kolb, Carl-Joachim, 4,489,522, Cl. 51-165.710.
Kollmorgen Technologies Corporation: *See*—
Brown, Lynnie B.; Ford, Charles J., III; and Dugan, Richard F., 4,490,661, Cl. 318-661.000.
Kolodzey, Hans-Juergen: *See*—
Schoening, Josef; Schwiers, Hans-Georg; Elter, Claus; Stracke, Wilfried; and Kolodzey, Hans-Juergen, 4,490,328, Cl. 376-285.000.
Komatsu, Hiroyuki: *See*—
Suzuki, Tomio; Tamura, Setsuo; Tanaka, Kozo; Hirose, Ryoichi; Komatsu, Hiroyuki; Tamada, Shinichi; Kasai, Taketsugu; and Tanimoto, Keisuke, 4,490,171, Cl. 75-42.000.
Komatsu Seiren Co., Ltd.: *See*—
Arashi, Masahiro, 4,489,575, Cl. 68-177.000.
Komine, Hiroshi; and Brosnan, Stephen J., to Northrop Corporation. Injection-locked unstable laser. 4,490,823, Cl. 372-95.000.
Komorizono, Junichi; and Miwa, Akihiko, to Aisin Seiki Kabushiki Kaisha. Tandem brake master cylinder. 4,489,556, Cl. 60-585.000.
Kon, Shizuo: *See*—
Inomata, Masashi; Kon, Shizuo; Kaku, Tsukasa; and Shinohara, Shizuo, 4,490,833, Cl. 378-58.000.
Kondo, Hideo: *See*—
Watabe, Tomiji; Kondo, Hideo; Matsuda, Toshihiko; Yano, Kenji; Dote, Yasuhiko; and Takagi, Matao, 4,490,621, Cl. 290-42.000.
Kong, Cathay G. T. Safety dyna-bender. 4,489,937, Cl. 272-137.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Iijima, Toshifumi; Onodera, Kaoru; and Fujimatsu, Wataru, 4,490,459, Cl. 430-505.000.
Kawaguchi, Yasushi; Mine, Kiyomitsu; Ide, Keiko; Yamashita, Yukie; Irie, Soichiro; and Hirao, Yotaro, 4,490,462, Cl. 430-543.000.
Shimba, Satoru; Watanabe, Yoshikazu; Kato, Kazuo; and Yamashita, Kiyotoshi, 4,490,460, Cl. 430-504.000.
Yamada, Noboru; and Yamaguchi, Keisuke, 4,489,765, Cl. 141-1.000.
Konno, Takeo: *See*—
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Harada, Kazuo; and Konno, Takeo, 4,490,434, Cl. 428-341.000.
Kono, Takashi; Kakuyama, Shinji; and Kamai, Toshimitsu, to Sony Corporation. Apparatus for recording and/or reproducing video and audio signals. 4,490,751, Cl. 358-330.000.
Konrad, Mathias; Herchenbach, Paul; and Kampf, Klaus, to Jean Walterscheid GmbH. Lubricated wide angle joint. 4,490,125, Cl. 464-11.000.
Konrath, Karl: *See*—
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,489,698, Cl. 123-502.000.
Konzal, Daryl R.; Johnson, Craig N.; and Baumgartner, Donald W., to Paper Machinery Corporation. Machine for forming seams of two-piece paper cups. 4,490,130, Cl. 493-106.000.
Kops, Earl A., to Gillman, Donald O., a part interest. Balancing machine for large rotatable parts. 4,489,605, Cl. 73-455.000.
Kopsho, Joseph D., Jr.; Suszynski, Edward D.; and Johnson, Reginald S., to Kraft Systems, Inc. Control stick assembly. 4,490,710, Cl. 338-128.000.
Korber, Marlies: *See*—
Schubert, Herrmann; Deutscher, Hans-Joachim; Kresse, Horst; Demus, Dietrich; Altmann, Heinz; Korber, Marlies; and Bottger, Ute, 4,490,278, Cl. 252-299.630.
Korhola, Ossi: *See*—
Riihimaki, Esko; and Korhola, Ossi, 4,490,615, Cl. 250-487.100.
Korte, Gerald A., to Diamond Brand Canvas Products Co., Inc. Backpack with improved comfort structure. 4,489,866, Cl. 224-155.000.
Korte, Jay S.; and Thees, John E. Pill dispensing device. 4,489,853, Cl. 221-187.000.
Kosaka, Yoshikazu: *See*—
Saitou, Kouichi; Tohyama, Shuaroku; and Kosaka, Yoshikazu, 4,490,149, Cl. 8-539.000.
Kosanovich, George M.; and Salee, Gideon, to Occidental Chemical Corporation. Semi or fully continuous process for polyester of bisphenol and dicarboxylic acid by transesterification polymerization and product thereof. 4,490,519, Cl. 528-179.000.
Kosowsky, Lester H.: *See*—
Botwin, Leo; and Kosowsky, Lester H., 4,490,719, Cl. 343-5.0MM.
Kossmehl, Gerhard; and Chatzitheodorou, Georg, to Bayer Aktiengesellschaft. Poly-(2,5-thiophendiyl)arsenic pentafluoride complexes. 4,490,509, Cl. 525-328.500.
Kostyrkin, Boris V.: *See*—
Prikhodko, Valery V.; Kostyrkin, Boris V.; and Tsarenko, Pavel I., 4,490,180, Cl. 134-1.000.
Kotzab, Werner: *See*—
Weiss, Siegfried; Heurich, Gunther; and Kotzab, Werner, 4,490,128, Cl. 474-166.000.
Kovacs, Miklos: *See*—
Besan, Janos; Kovacs, Miklos; Kulcsar, Laszlo; Maier, Ferenc; and Pernyeszi, Jozsef, 4,490,539, Cl. 548-262.000.
Koverman, Charles A.: *See*—
Bolton, David R.; Koverman, Charles A.; and Neargarder, Marvin L., 4,489,872, Cl. 226-117.000.
Kovshev, Evgeny I.: *See*—
Grebenkin, Mikhail F.; Ivashenko, Alexandr V.; Karamysheva, Ljudmila A.; Blinov, Lev M.; Kovshev, Evgeny I.; Shtykov, Nikolai M.; Titov, Viktor V.; Shoshin, Vadim M.; Agafonova, Irina F.; and Barnik, Mikhail I., 4,490,277, Cl. 252-299.600.
Kowalski, David J.: *See*—
Fong, Dodd W.; and Kowalski, David J., 4,490,308, Cl. 260-513.00N.
Kowols, Gilbert J., to Mobile Mark, Inc. Adjustable top loaded antenna. 4,490,727, Cl. 343-895.000.
Krachanov, Hristo G.: *See*—
Marev, Kiril S.; Krachanov, Hristo G.; Bratanov, Anton A.; and Kirchev, Nikolay A., 4,490,335, Cl. 422-269.000.

Kraft Systems, Inc.: *See*—
Kopsho, Joseph D., Jr.; Suszynski, Edward D.; and Johnson, Reginald S., 4,490,710, Cl. 338-128.000.
Krag, Jens: *See*—
Pisecky, Jan; Krag, Jens; and Sorensen, Ib H., 4,490,403, Cl. 426-453.000.
Krantz America, Inc.: *See*—
Morizzo, Nicholas L., 4,489,900, Cl. 242-56.00R.
Kranz, Joachim: *See*—
Fechner, Wolf D.; Kranz, Joachim; and Polster, Rudolf, 4,490,176, Cl. 106-23.000.
Krause, Lothar: *See*—
Gomann, Rolf; and Krause, Lothar, 4,489,534, Cl. 53-151.000.
Kresse, Horst: *See*—
Schubert, Herrmann; Deutscher, Hans-Joachim; Kresse, Horst; Demus, Dietrich; Altmann, Heinz; Korber, Marlies; and Bottger, Ute, 4,490,278, Cl. 252-299.630.
Krieg, Larry M.: *See*—
Gasparaitis, Bernard V.; Krieg, Larry M.; Schweet, Richard R.; Williams, William R.; and Burbank, Raymond W., 4,490,813, Cl. 365-63.000.
Krivenko, Valery G.: *See*—
Kuchuk-Yatsenko, Sergei I.; Krivenko, Valery G.; Bogorsky, Mikhail V.; Lazebny, Ivan L.; Porkhun, Fedor K.; Sakharnov, Vasily A.; and Cherednichok, Vitaly T., 4,490,081, Cl. 409-300.000.
Kroger, Harry, to Sperry Corporation. Josephson device with tunneling barrier having low density of localized states and enhanced figures of merit. 4,490,733, Cl. 357-5.000.
Kroll, Peter, to Gebhard Balluff Fabrik GmbH & Co. Mounting device for a rod-shaped proximity switch. 4,489,467, Cl. 24-525.000.
KRONES AG Hermann Kronseder, Maschinenfabrik: *See*—
Schneider, Egon, 4,489,820, Cl. 198-448.000.
Kropp, Lev: *See*—
Becker, Kenneth W.; Friedrichs, Louis G., Jr.; Kropp, Lev; and Straka, Richard B., 4,490,401, Cl. 426-407.000.
Kruger, Gerd: *See*—
Reiffen, Manfred; Heider, Joachim; Hauel, Norbert; Austel, Volkhard; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Noll, Klaus; Pieper, Helmut; Kruger, Gerd; and Keck, Johannes, 4,490,369, Cl. 424-244.000.
Krupp Polysius AG: *See*—
Krutzner, Karl, 4,490,109, Cl. 432-106.000.
Kruppert Enterprises, Inc.: *See*—
Kruppert, Frederick W., 4,490,187, Cl. 148-12.00R.
Kruppert, Frederick W., to Kruppert Enterprises, Inc. Method for heat treating steel. 4,490,187, Cl. 148-12.00R.
Krutzner, Karl, to Krupp Polysius AG. Apparatus for heat treatment of fine-grained material. 4,490,109, Cl. 432-106.000.
Kubo, Kazuyuki: *See*—
Monma, Hisayoshi; Miyasaka, Masao; and Kubo, Kazuyuki, 4,490,058, Cl. 400-146.000.
Kuchar, Paul J.: *See*—
Pacanowski, Ronald F.; Sampson, Robert W.; and Kuchar, Paul J., 4,489,592, Cl. 73-30.000.
Kucher, Gerhard, to Wild Heerbrugg Aktiengesellschaft. Exposure-control device on an aerial camera. 4,490,028, Cl. 354-66.000.
Kuchuk-Yatsenko, Sergei I.; Krivenko, Valery G.; Bogorsky, Mikhail V.; Lazebny, Ivan L.; Porkhun, Fedor K.; Sakharnov, Vasily A.; and Cherednichok, Vitaly T., to Institut Elektrosvarki Imeni E.O. Patona Akademit Nauk Ukrainskoi SSR. Arrangement for removing burrs in butt resistance welding of workpieces. 4,490,081, Cl. 409-300.000.
Kuchuk-Yatsenko, Sergei I.: *See*—
Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; and Galian, Boris A., 4,490,599, Cl. 219-61.100.
Kuenzi, Martin: *See*—
Ghisalba, Oreste; Heinzer, Franz; and Kuenzi, Martin, 4,490,471, Cl. 435-253.000.
Kuisl, Max; and Klein, Manfred, to Licentia Patent-Verwaltungs-G.m.b.H. Method of and an apparatus for measuring ion concentrations in solutions. 4,490,678, Cl. 324-438.000.
Kukes, Simon G.: *See*—
Banks, Robert L.; and Kukes, Simon G., 4,490,478, Cl. 502-254.000.
Kulcsar, Laszlo: *See*—
Besan, Janos; Kovacs, Miklos; Kulcsar, Laszlo; Maier, Ferenc; and Pernyeszi, Jozsef, 4,490,539, Cl. 548-262.000.
Kumahira Safe Co., Inc.: *See*—
Masachika, Hiroshi, 4,489,662, Cl. 109-66.000.
Kumakura, Mikio: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Minami, Tamotsu; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,490,393, Cl. 424-263.000.
Kumbrant, Lars; Olofsson, Gunnar; and Larsson, Mats, to Rockwool Aktiebolaget. Apparatus for testing and taking samples from liquid metal. 4,489,604, Cl. 73-432.00R.
Kumoi, Sadakatsu; Sakka, Hideo; and Tsutsumi, Yukihiro, to Toyo Soda Manufacturing Co., Ltd. Method for preparing bis[β-(N,N-dimethylamino)ethyl]ether. 4,490,556, Cl. 564-508.000.
Kung, David, to National Semiconductor Corporation. Totem pole/open collector selectable output circuit. 4,490,631, Cl. 307-456.000.
Kunkler, Larry D.: *See*—
Zimmerman, Robert R.; Kunkler, Larry D.; and Helderman, Earl R., 4,490,408, Cl. 427-42.000.
Kuntman, Daryal, to Bendix Corporation, The. Multipulse signal processing for radar system. 4,490,720, Cl. 343-17.1PW.
Kuo, Chan-Hwa, to Merck & Co., Inc. Process for 4a'(R),5'-dihydromevinolin. 4,490,546, Cl. 549-292.000.
Kuo, Samuel C., to GTE Products Corporation. Log-periodic antenna. 4,490,725, Cl. 343-792.500.
Kurihara, Kazuhiko: *See*—
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,489,630, Cl. 83-15.000.
Kurimoto, Tatsuo: *See*—
Tsuda, Tetsuaki; Kurimoto, Tatsuo; and Shibuya, Atsuyoshi, 4,490,438, Cl. 428-613.000.
Kuromatsu, Akio, to Ohyo Jiki Lab. Co.; and Nicco Machine Tool Company, Ltd. Grinding wheel for electrolytic and mechanical grinding. 4,490,158, Cl. 51-293.000.
Kurosaki Furnace Industries Company Limited: *See*—
Kimura, Kensaku; and Watanabe, Toshio, 4,490,107, Cl. 432-11.000.
Kurosaki Refractries Company Limited: *See*—
Kimura, Kensaku; and Watanabe, Toshio, 4,490,107, Cl. 432-11.000.
Kurtz, Rudiger, to Escher Wyss GmbH. Papermaking machine with central dewatering cylinder. 4,490,212, Cl. 162-298.000.
Kurushima, Tadanori: *See*—
Kawabata, Susumu; Inoue, Tetsuzo; Kurushima, Tadanori; and Kamiya, Kazuo, 4,489,547, Cl. 57-415.000.
Kusaka, Hiroyuki: *See*—
Mizuno, Tsutomu; and Kusaka, Hiroyuki, 4,490,348, Cl. 423-645.000.
Kusanagi, Shigekazu; Akiyama, Shigeo; Nobutani, Tohru; and Kawamura, Hideo, to Matsushita Electric Works, Ltd. Gas detector. 4,490,715, Cl. 340-634.000.
Kuse, Kazuki: *See*—
Yoshida, Hiroshi; Akashi, Shunji; and Kuse, Kazuki, 4,489,873, Cl. 226-162.000.
Kussi, Siegfried: *See*—
Hentschel, Karl-Heinz; Mussig, Bernhard; Dhein, Rolf; and Kussi, Siegfried, 4,490,266, Cl. 252-49.800.
Kutnyak, Thomas A., to Automation Industries, Inc. Flexible hose with external sheathed electrical conductor. 4,490,575, Cl. 174-47.000.
Kuzmin, Alexei V.: *See*—
Shamarokov, Alexandr S.; Kuzmin, Alexei V.; Glebov, Vladimir P.; Moskvichev, Viktor F.; Morozova, Nadezhda A.; Filippov, Gennady A.; Tarankov, Gennady A.; Lukasevich, Boris I.; Andreev, Leonid M.; and Grishakov, Viktor I., 4,489,788, Cl. 122-32.000.
Kwak, Solim S. W., to United States of America, Army. Conversion of FS smoke agent (a mixture of sulfur trioxide and chlorosulfonic acid) to sulfamic acid and ammonium chloride. 4,490,345, Cl. 423-389.000.
Kyodo Kisen Kaisha, Ltd: *See*—
Yamamoto, Hideo; and Katsube, Seiichi, 4,489,708, Cl. 126-362.000.
L. B. Industries, Inc.: *See*—
Thirion, Paul J., 4,489,868, Cl. 224-321.000.
La Telemecanique Electrique: *See*—
Dumont, Alain D. G.; and Fouret, Rene , 4,490,702, Cl. 335-169.000.
Laanio, Verena; von Orelli, Marcus; and Hausermann, Walter, to Ciba-Geigy Corporation. Synergistic pesticidal compositions comprising fenvalerate and 2,4-diamino-6-cyclopropylamino-s-triazine or 2,4-diamino-6-isopropylamino-s-triazine. 4,490,372, Cl. 424-249.000.
Laboratoire L. Lafon: *See*—
Lafon, Louis, 4,490,407, Cl. 427-2.000.
Lacher, William A., to Burroughs Corporation. Centralized clock time error correction system. 4,490,821, Cl. 371-1.000.
Lachman, Ignacy: *See*—
Plaskura, Andrzej; Lachman, Ignacy; Byrka, Tadeusz; Leszczynski, Zbigniew; Rogalski, Krzysztof; Koch, Marta; and Zyczynski, Jozef, 4,490,310, Cl. 261-79.00A.
Laciny, Richard W.: *See*—
Yeadon, Edward C.; and Laciny, Richard W., 4,490,608, Cl. 250-235.000.
Lacko, Mark A.; Brooks, Malcolm J.; Spranger, Douglas M.; and Mitchell, Peter P., to Becton Dickinson and Company. Catheter stabilizer and method of securing same to a patient. 4,490,141, Cl. 604-180.000.
Lafon, Louis, to Laboratoire L. Lafon. Method for preparing galenic formulations particularly for pharmaceutical, dietetical, cosmetic and diagnostic uses. 4,490,407, Cl. 427-2.000.
Laforest, Pierre: *See*—
Gagnon, Pierre; and Laforest, Pierre, 4,489,817, Cl. 192-18.00A.
Lagergren, Esther R.: *See*—
Morris, Henrietta K.; and Lagergren, Esther R., 4,489,720, Cl. 128-132.00D.
Lahille, Michel: *See*—
Evrard, Paul; Lahille, Michel; and Avenel, Michel, 4,490,497, Cl. 524-349.000.
Lahneman, Henry C., III. Adjustable storage tray assembly. 4,489,831, Cl. 206-371.000.
Lahoda, Edward J.; Weisberg, Sharon L.; and White, Robert W., to Westinghouse Electric Corp. Separation of isotopes of zirconium. 4,490,225, Cl. 204-158.00R.
Laidig, Manfred R., to Singer Company, The. Terminal for flexible tube. 4,489,961, Cl. 285-116.000.
L'Air Liquide-Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Bruni, Maurice; and Duboz, George, 4,490,152, Cl. 44-50.000.
Laitram Corporation, The: *See*—
Lapeyre, James M., 4,490,232, Cl. 204-278.000.

Lancaster, Henry D.; Fugitt, Jock A.; and Howard, Donald R., to United States of America, Energy. Stabilized radio frequency quadrupole. 4,490,648, Cl. 315-5.410.

Lancy International, Inc.: *See*—
Warheit, Kevin E., 4,490,224, Cl. 204-130.000.

Landis, John M.: *See*—
Asick, John C.; Douty, George H.; Goodman, Joseph R.; Jones, Kermit M., Jr.; Landis, John M.; Snyder, Clair W., Jr.; Woratyla, John A.; and Zell, Dale R., 4,489,998, Cl. 339-17.0LM.
Asick, John C.; and Landis, John M., 4,490,000, Cl. 339-17.0LM.

Landstingens Inkopscentral, LIC, ekonomisk forening: *See*—
Beckestrom, Bo, 4,490,148, Cl. 604-385.000.

Lange, Peter-Michael: *See*—
Halcour, Kurt; Lange, Peter-Michael; and Wagner, Rudolf, 4,490,487, Cl. 521-53.000.

Langer, Heinz-Guenther, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Insulating layer for a rocket propellant or rocket motor. 4,489,657, Cl. 102-290.000.

Langer, Helmar: *See*—
Zimmermann, Werner; and Langer, Helmar, 4,489,611, Cl. 73-625.000.

Langlois, Daniel A.: *See*—
Erickson, Erick E.; and Langlois, Daniel A., 4,490,745, Cl. 358-250.000.

Lankard, John R.: *See*—
Chen, Lee; Lankard, John R.; and Mathad, Gangadhara S., 4,490,211, Cl. 156-643.000.

Lantz, John M., to Borg-Warner Chemicals, Inc. Apparatus for separating a low viscosity material from a high viscosity material. 4,490,104, Cl. 425-197.000.

Lapenskie, Garry P. Ankle support. 4,489,719, Cl. 128-80.00H.

Lapeyre, James M., to Laitram Corporation, The. Wave-powered electrolysis of water. 4,490,232, Cl. 204-278.000.

Larrabee, Antoinette L.: *See*—
Spadini, Gianfranco L.; Larrabee, Antoinette L.; and Liu, Don K. K., 4,490,271, Cl. 252-174.230.

Larson, David D.: *See*—
Conly, Douglas J.; Baker, Bonnie B.; Larson, David D.; and Riddle, Stanley T., 4,490,032, Cl. 355-14.00R.

Larson, Marlow W. Archery device. 4,489,705, Cl. 124-35.00A.

Larsson, Mats: *See*—
Kumbrant, Lars; Olofsson, Gunnar; and Larsson, Mats, 4,489,604, Cl. 73-432.00R.

Latenser, John F. Flexion-traction back relaxing system. 4,489,713, Cl. 128-71.000.

Lattin, Leonard. Seed planter press wheel. 4,489,790, Cl. 172-519.000.

Latzke, Arno W., to Energy-Pak, Ltd. Magnetic plaster. 4,489,711, Cl. 128-1.300.

Laukien, Gunther: *See*—
Knuettel, Bertold; and Laukien, Gunther, 4,490,675, Cl. 324-319.000.

Lawrence, John T.; and Swartz, John C., to AMP Incorporated. Connector for connecting insulated wires to a circuit board. 4,490,004, Cl. 339-95.00R.

Lawson, John E., to Armco Inc. Multiple flowline connector. 4,490,073, Cl. 405-169.000.

Lazarre, Flavien; and Bruneau, Jean, to Societe Nationale Elf Aquitaine (Production). Safety device for igniting fuel gases discharged by a flare. 4,490,106, Cl. 431-90.000.

Lazebny, Ivan L.: *See*—
Kuchuk-Yatsenko, Sergei I.; Krivenko, Valery G.; Bogorsky, Mikhail V.; Lazebny, Ivan L.; Porkhun, Fedor K.; Sakharnov, Vasily A.; and Cherednichok, Vitaly T., 4,490,081, Cl. 409-300.000.

LeaRonal, Inc.: *See*—
Houman, John, 4,490,220, Cl. 204-52.00R.

Leban, Audrey, executor: *See*—
Leban, Carl; and Leban, Audrey, executor, 4,490,789, Cl. 364-419.000.

Leban, Carl; and Leban, Audrey, executor. Method and means for reproducing non-alphabetic characters. 4,490,789, Cl. 364-419.000.

Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; and Galian, Boris A., to Institut Elektrovarki Imeni E.O. Patona. Apparatus for flash welding of pipes. 4,490,599, Cl. 219-61.100.

Lecler, Martial H.: *See*—
Daime, Jean P.; and Lecler, Martial H., 4,489,579, Cl. 72-38.000.

Leco, Inc.: *See*—
Bose, Ajit, 4,490,203, Cl. 156-251.000.

Lectromelt Corporation: *See*—
Persson, John A., 4,490,169, Cl. 75-11.000.
Persson, John A., 4,490,825, Cl. 373-96.000.

Lee, Fred S. Method of making thin film magnetic recording heads. 4,489,484, Cl. 29-603.000.

Lee, James K.: *See*—
Frank, Lee F.; and Lee, James K., 4,490,027, Cl. 354-21.000.

Lee, Minyoung; Borom, Marcus P.; and Szala, Lawrence E., to General Electric Company. Rapid rate sintering of ceramics. 4,490,319, Cl. 264-65.000.

Lee, Rock S. Y.: *See*—
Fahim, Atef E. F.; Lee, Rock S. Y.; and Cheng, Richard M. H., 4,489,792, Cl. 173-48.000.

Leedahl, Wesley C.: *See*—
Hull, Warren L.; Leedahl, Wesley C.; and Notch, Donald R., 4,489,470, Cl. 29-157.30C.

Leeds, Donald H., to B. F. Goodrich Company, The. Method of fabricating carbon composites. 4,490,201, Cl. 156-155.000.

Lehrer, William I.: *See*—
Pierce, John M.; and Lehrer, William I., 4,490,737, Cl. 357-73.0JJ.

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Kaminaka, Nobuyuki; Kanai, Kenji; and Nomura, Noboru, 4,490,760, Cl. 360-126.000.
Kawarada, Hiroshi; Tatsumichi, Toshio; Wakahata, Yasuo; Hamanaka, Mitsuyoshi; and Kajitani, Tamotsu, 4,490,015, Cl. 350-340.000.
Maruyama, Teruo, 4,490,759, Cl. 360-107.000.

Matsushita Electric Works, Ltd.: *See*—
Dietrich, Bernhard; Matsushita, Hidetoshi; and Mori, Tetsuo, 4,490,701, Cl. 335-78.000.
Kusanagi, Shigekazu; Akiyama, Shigeo; Nobutani, Tohru; and Kawamura, Hideo, 4,490,715, Cl. 340-634.000.

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Matsuzaki, Michiyoshi, to Nippon Piston Ring Co., Ltd. Vane for rotary fluid compressors. 4,490,175, Cl. 75-126.00C.

Matsuzaki, Takeshi, to Fuji Jukogyo Kabushiki Kaisha. Air-fuel ratio control system. 4,489,693, Cl. 123-440.000.

Mattei, Riccardo: *See*—
Seragnoli, Enzo; and Mattei, Riccardo, 4,489,631, Cl. 83-278.000.

Mattina, Charles F., Jr.; and Selke, William A., to Kimberly-Clark Corporation. Smokable tobacco composition and method of making. 4,489,739, Cl. 131-352.000.

Matts, Sigvard, to Flakt Aktiebolag. System and method for controlling energization of electrodes in electrostatic dust separators. 4,490,159, Cl. 55-2.000.

Mattson, William F.; and Trapp, Dennis L., to B. F. Goodrich Company, The. Process for multi-stage dead-end-water tire curing. 4,490,325, Cl. 264-315.000.

Maugle, George H.: *See*—
Gordon, Robert L.; Maugle, George H.; and Cooper, Keith A., 4,489,537, Cl. 53-511.000.

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Maurer, Helmut: *See*—
Linder, Ernst; Maurer, Helmut; and Muller, Klaus, 4,489,596, Cl. 73-116.000.
Maurice, Terrence J.; and Grealy, Jennifer M., to General Foods Inc. Process for the production of protein fibres. 4,490,397, Cl. 426-276.000.
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Weichselgartner, Heinrich, 4,490,288, Cl. 252-630.000.
May, Keith: *See*—
Gani, Mohamed M.; May, Keith; and Porter, Philip, 4,490,290, Cl. 260-112.00B.
Maybell, Michael J.: *See*—
Hardie, George S.; Hernandez, Raphael; and Maybell, Michael J., 4,490,723, Cl. 343-754.000.
Mayer, Andrew S.: *See*—
Becker, James F.; and Mayer, Andrew S., 4,490,123, Cl. 446-204.000.
Mayhew, Raymond L.: *See*—
Corti, Miguel; and Mayhew, Raymond L., 4,490,536, Cl. 548-112.000.
Mazur, Robert G., to Solid State Measurements, Inc. Apparatus for abrading workpieces, particularly semiconductor wafers. 4,489,521, Cl. 51-161.000.
McBratney, Peter, to F. F. Seeley Nominees Pty. Ltd. Terminal tray for retaining the leads of an electric motor. 4,490,636, Cl. 310-71.000.
McClain, Robert L.: *See*—
Meyer, Leonard S.; Murray, Michael J.; Hayes, Gerald G.; and McClain, Robert L., 4,489,876, Cl. 228-170.000.
McConnell, Harden M., to Molecular Devices Corporation. Lipid membrane electroanalytical elements and method of analysis therewith. 4,490,216, Cl. 204-1.00T.
McConnell, William H.: *See*—
Hill, Murray K.; and McConnell, William H., 4,490,766, Cl. 360-137.000.
McCready, Newton W., to Amchem Products, Inc. Alkaline cleaning of tin surfaces. 4,490,181, Cl. 134-2.000.
McCurdy, Edwin L. Movable air supply for combustion apparatus. 4,489,666, Cl. 110-297.000.
McDonald, Paul D.: *See*—
Read, Clifford D.; Dolan, Bruce I.; and McDonald, Paul D., 4,490,604, Cl. 235-146.000.
McDonough, Kevin C.; and Bellay, Jeffrey D., to Texas Instruments Incorporated. Microcomputer with self-test of microcode. 4,490,783, Cl. 364-200.000.
McDougal, Thomas F. Hydraulically actuated clamping table assembly. 4,489,924, Cl. 269-23.000.
McElroy, David J., to Texas Instruments Incorporated. Semiconductor device and method of making. 4,490,736, Cl. 357-41.000.
McGraw-Edison Company: *See*—
Lind, LeRoger J., 4,490,638, Cl. 310-269.000.
McInerney, Charles E.: *See*—
Cholvin, Robert L.; McInerney, Charles E.; Nancarrow, James N.; and Gantz, Jack L., 4,489,702, Cl. 123-564.000.
McIntosh, Arthur M., to Borg-Warner Corporation. Dual wet output clutch for power selection in a continuously variable transmission. 4,489,621, Cl. 74-355.000.
McKay, Dwight L.: *See*—
Bertus, Brent J.; and McKay, Dwight L., 4,490,299, Cl. 260-429.00R.
McLane, Jack E.; Schenk, Raymond L.; and Wirtz, John W., to Wirtz Manufacturing Company, Inc. Drum for continuous casting machine. 4,489,772, Cl. 164-423.000.
McMinn, Robert R., to Harrison Equipment Co., Inc. Hydraulically driven generator system with air conditioning means. 4,490,619, Cl. 290-2.000.
McMordie, Bruce G.: *See*—
Mosser, Mark F.; McMordie, Bruce G.; and Fabiny, William J., 4,489,670, Cl. 118-55.000.
McNichols, Larry A.: *See*—
Sorenson, Paul D.; and McNichols, Larry A., 4,489,729, Cl. 128-660.000.
MC2 Ltd.: *See*—
Terrell, Christopher E., 4,489,836, Cl. 211-45.000.
Mead Corporation, The: *See*—
Calvert, Rodney K., 4,489,880, Cl. 229-40.000.
Clark, Frederic L.; and Wallace, David B., 4,490,729, Cl. 346-75.000.
Mead, Theodore C.; and Wright, James H., to Texaco Inc. Process for reclaiming used lubricating oil. 4,490,245, Cl. 208-179.000.
Mearig, Stephen G.: *See*—
Culp, Charles R.; and Mearig, Stephen G., 4,490,217, Cl. 204-11.000.
Meccanotex S.p.A.: *See*—
Albonico, Franco, 4,489,813, Cl. 188-24.210.
Medical Designs, Inc.: *See*—
Martin, Kelsey, 4,489,718, Cl. 128-80.00C.
Medical Engineering Corporation: *See*—
Ferraro, Rick J.; and Lynch, Henry W., 4,489,722, Cl. 128-207.150.
Medtronic, Inc.: *See*—
Sorenson, Paul D.; and McNichols, Larry A., 4,489,729, Cl. 128-660.000.
Meier, Jacques, to Ferag AG. Apparatus for collecting folded printed sheets. 4,489,930, Cl. 270-55.000.
Meiji, Anahara: *See*—
Susumu, Kawabata; Hiroshi, Niimi; Meiji, Anahara; and Hiroshi, Omori, 4,489,545, Cl. 57-333.000.
Meinherz, Manfred; and Tietze, Jorg, to Siemens Aktiengesellschaft. Electric disconnect or grounding switch having a movable switch blade. 4,490,595, Cl. 200-254.000.
Mengel, Clare L. Microwave permeable pressure compensating container. 4,490,597, Cl. 219-10.55E.
Mengon, Albert C., deceased: *See*—
Jaquay, Louis H.; and Mengon, Albert C., deceased, 4,490,237, Cl. 208-11.00R.
Mengon, Mary A., administratrix: *See*—
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Menon, Narandranath, to General Electrodynamics Corp. Weight measuring apparatus with a distributed array of spring elements. 4,489,799, Cl. 177-209.000.
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Merck & Co., Inc.: *See*—
Bolhofer, William A.; and Hoffman, Jacob M., 4,490,533, Cl. 546-332.000.
Dean, Richard T.; Dorn, Conrad P., Jr.; and Shen, Tsung-Ying, 4,490,303, Cl. 260-453.990.
Kuo, Chan-Hwa, 4,490,546, Cl. 549-292.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Bernhard, Horst, 4,490,179, Cl. 106-308.00F.
Eidenschink, Rudolf; Romer, Michael; and Weber, Georg, 4,490,305, Cl. 260-465.00F.
Hsu, Ying-Yen, 4,490,276, Cl. 252-299.610.
Limbach, Berthold; and Helger, Roland, 4,490,465, Cl. 435-14.000.
Merckel, Gerald U.: *See*—
Dixon, Jerry D.; Marazas, Gerald A.; and Merckel, Gerald U., 4,490,782, Cl. 364-200.000.
Mericle, Robert W.: *See*—
Beroff, Howard; Thompson, Darrell R.; Mericle, Robert W.; and Travis, William C., Jr., 4,490,326, Cl. 264-328.160.
Meriwether, Lewis S., to American Cyanamid Company. Antiperspirant method containing vanadium salts. 4,490,354, Cl. 424-65.000.
Merkator, Manfred: *See*—
Huber, Siefried; and Merkator, Manfred, 4,490,771, Cl. 361-154.000.
Merrill, John T., to United States of America, Energy. Liquid blocking check valve. 4,489,744, Cl. 137-202.000.
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Poag, D. W.; and Merritt, W. R., 4,489,663, Cl. 109-76.000.
Merry, Clayton. Clam digging tool. 4,489,969, Cl. 294-50.800.
Merryware Industries, Inc.: *See*—
Haythornthwaite, Peter F., 4,489,912, Cl. 248-359.000.
Messenger, Joseph U. Well control method using low-melting alloy metals. 4,489,784, Cl. 166-288.000.
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Langer, Heinz-Guenther, 4,489,657, Cl. 102-290.000.
Peikert, Juergen, 4,489,550, Cl. 60-204.000.
Walter, Siegfried, 4,489,580, Cl. 72-46.000.
Zimmermann, Werner; and Langer, Helmar, 4,489,611, Cl. 73-625.000.
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Oakley, John R., 4,490,129, Cl. 493-8.000.
Metallgesellschaft AG: *See*—
Formanek, Lothar; Hirsch, Martin; Schnabel, Wolfram; Serbent, Harry; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Arlt, Detmar, 4,490,168, Cl. 75-10.00R.
Metallurgie Hoboken-Overpelt: *See*—
De Schepper, Achille; and Coussement, Marc, 4,490,338, Cl. 423-54.000.
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Nufer, Bruno; and Luchinger, Paul, 4,489,800, Cl. 177-212.000.
Meyer, John D.: *See*—
Vaught, John L.; Cloutier, Frank L.; Donald, David K.; Meyer, John D.; Tacklind, Christopher A.; and Taub, Howard H., 4,490,728, Cl. 346-1.100.
Meyer, Leonard S.; Murray, Michael J.; Hayes, Gerald G.; and McClain, Robert L., to Kidde Recreation Products, Inc. Method of making a fabricated sheet metal compression mold. 4,489,876, Cl. 228-170.000.
Meyer, Richard C. Pipet signalling system. 4,489,618, Cl. 73-864.160.
Meyer, Richard C.; and Kan, Peter, to Beckman Instruments, Inc. Method for driving a stepper motor. 4,490,665, Cl. 318-696.000.
Michaels, Leonard H.; and Stuart, Jerry E., to Ideal Industries, Inc. Cable stripper. 4,489,490, Cl. 30-90.100.
Michigan Hanger Company: *See*—
Rumble, Ray M., 4,489,908, Cl. 248-62.000.
Microdot Inc.: *See*—
Miller, Paul H.; and Stelzner, Charles D., 4,490,587, Cl. 200-5.00A.
Middle East Trade Alliance, Inc.: *See*—
Ab, Emil A., 4,490,832, Cl. 378-47.000.
Miedema, Andries R.: *See*—
Gerkema, Jan; and Miedema, Andries R., 4,490,264, Cl. 252-12.000.
Migliori, Albert: *See*—
Wheatley, John C.; Swift, Gregory W.; and Migliori, Albert, 4,489,553, Cl. 60-516.000.
Mikols, Wayne J., to Shell Oil Company. Stabilized bituminous blends. 4,490,493, Cl. 524-68.000.

Mikuni Kogyo Kabushiki Kaisha: *See*—
Kamiyama, Shuichi; and Okada, Yoji, 4,490,663, Cl. 318-696.000.
Milek, Henry F.: *See*—
Brak, Stephen B.; and Milek, Henry F., 4,489,538, Cl. 53-576.000.
Miller Brewing Company: *See*—
Becker, Kenneth W.; Friedrichs, Louis G., Jr.; Kropp, Lev; and Straka, Richard B., 4,490,401, Cl. 426-407.000.
Miller, David K.: *See*—
Ives, David C.; Miller, David K.; and Steely, Simon, Jr., 4,490,784, Cl. 364-200.000.
Miller, Frank A.: *See*—
Moench, Jerry D.; and Miller, Frank A., 4,490,627, Cl. 307-290.000.
Miller, George T., to Occidental Chemical Corporation. Encapsulated efficacious zinc phosphide rodenticide. 4,490,352, Cl. 424-17.000.
Miller, Harry, to Sperry Corporation. Cruise speed control for aircraft performance management system. 4,490,793, Cl. 364-433.000.
Miller, Harry, to Sperry Corporation. Takeoff weight computer apparatus for aircraft. 4,490,802, Cl. 364-567.000.
Miller, John E., to Parma Corporation. Body support for bed or seat. 4,489,450, Cl. 5-250.000.
Miller, Paul H.; and Steitzner, Charles D., to Microdot Inc. Switch assembly. 4,490,587, Cl. 200-5.00A.
Miller, Robert A. Jumping rope. 4,489,934, Cl. 472-75.000.
Miller, Robert L.: *See*—
Bogan, Leonard E.; Knapke, Paul H.; and Miller, Robert L., 4,490,819, Cl. 370-84.000.
Miller, Russell S., to General Electric Company. Method of casting with pool boiling cooling of substrate casting surface. 4,489,773, Cl. 164-463.000.
Minami, Koichi: *See*—
Hatakeyama, Morichika; and Minami, Koichi, 4,489,944, Cl. 273-154.000.
Minami, Syuji; Toyota, Akinori; and Kashiwa, Norio, to Mitsui Petrochemical Industries, Ltd. Process for producing polymers or copolymers of olefins containing at least three carbon atoms and catalysts therefor. 4,490,513, Cl. 526-128.000.
Minami, Tamotsu: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Minami, Tamotsu; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,490,393, Cl. 424-263.000.
Mine, Kiyomitsu: *See*—
Kawaguchi, Yasushi; Mine, Kiyomitsu; Ide, Keiko; Yamashita, Yukie; Irie, Soichiro; and Hirao, Yotaro, 4,490,462, Cl. 430-543.000.
Mineshima, Makoto, to Kabushiki Kaisha Velonar. Device for adjusting movement of photographic lens and field of viewfinder. 4,490,031, Cl. 354-402.000.
Miniet, Jay J., to Motorola, Inc. Socket and flexible PC board assembly and method for making. 4,489,999, Cl. 339-17.0CF.
Minks, Floyd M. Electric power system. 4,490,779, Cl. 363-48.000.
Minnesota Mining and Manufacturing Company: *See*—
Hovey, Dean L., 4,490,005, Cl. 339-278.00C.
Jordan, Stanley J., 4,490,432, Cl. 428-220.000.
Pendergrass, Daniel B., Jr., 4,490,505, Cl. 524-591.000.
Minney, Stephen C.; and Harmony, Daniel C., to Engineering & Research Associates, Inc. Blood tubing sealing unit. 4,490,598, Cl. 219-10.810.
Minolta Camera Kabushiki Kaisha: *See*—
Sugiura, Masamichi, 4,490,035, Cl. 355-8.000.
Tanaka, Harumi; Ueda, Hiroshi; Maeda, Keisuke; and Yoshizaki, Akira, 4,490,029, Cl. 354-106.000.
Mioduszewski, David: *See*—
Dickinson, William D.; Mioduszewski, David; and Bernardin, Frederick E., Jr., 4,489,779, Cl. 166-64.000.
Miranol Chemical Company, Inc.: *See*—
Desai, Bharat B., 4,490,355, Cl. 424-70.000.
Mirtich, Michael J.; Sovey, James S.; and Banks, Bruce A., to United States of America, National Aeronautics and Space Administration. Deposition of diamondlike carbon films. 4,490,229, Cl. 204-192.00C.
Mistyurik, John D., to Monarch Marking Systems, Inc. Printing apparatus using snap finger feed assembly and method of assembly. 4,490,060, Cl. 400-617.000.
Misumi, Teruo; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Shirai, Shigeru, to Canon Kabushiki Kaisha. Photoconductive member comprising multiple amorphous layers. 4,490,454, Cl. 430-84.000.
Mitamura, Masahiro: *See*—
Moribe, Yoshihiro; Hayashi, Yukitaka; and Mitamura, Masahiro, 4,490,662, Cl. 318-685.000.
Mitchell, Larry L., to Bobo, Jimmy R.; and Fowler, Wilbur P. Method of hanging wallpaper. 4,490,198, Cl. 156-71.000.
Mitchell, Peter P.: *See*—
Lacko, Mark A.; Brooks, Malcolm J.; Spranger, Douglas M.; and Mitchell, Peter P., 4,490,141, Cl. 604-180.000.
Mitech Corporation: *See*—
Kleiner, Lothar W., 4,490,283, Cl. 252-512.000.
Mitsubishi Chemical Industries Ltd.: *See*—
Oguri, Yasuo; Awata, Mitsuru; Saito, Junji; Inoue, Soichi; and Ariyama, Noriyuki, 4,490,320, Cl. 264-82.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Matsuda, Setsuyuki, 4,490,590, Cl. 200-50.00C.
Takeda, Fumio; Ishida, Osami; and Isoda, Yoji, 4,490,696, Cl. 333-137.000.
Yonemoto, Masashi; and Kajiyama, Ryuichi, 4,489,811, Cl. 187-29.00R.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Tanaka, Toru; Hataya, Masazori; and Tanaka, Kazuo, 4,490,554, Cl. 562-486.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Kinoshita, Mitsutaka; Nakagami, Tatsuro; Murakami, Nobuaki; Endo, Norio; Tamura, Fumio; and Danno, Yoshiaki, 4,489,685, Cl. 123-198.00F.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Ito, Yoshifumi; Yanagi, Kenichi; Shinoda, Naoharu; and Higaki, Seiji, 4,490,161, Cl. 55-181.000.
Mitsubishi Light Metal Industries Limited: *See*—
Kawamata, Yutaka; and Matsuo, Akira, 4,490,826, Cl. 373-97.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Minami, Syuji; Toyota, Akinori; and Kashiwa, Norio, 4,490,513, Cl. 526-128.000.
Nagano, Riichiro; and Sagane, Toshihiro, 4,490,508, Cl. 525-316.000.
Mitsui Toatsu Kagaki Kabushiki Kaisha: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Minami, Tamotsu; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,490,393, Cl. 424-263.000.
Mitsumori, Naomichi: *See*—
Maki, Yoshifumi; Sako, Magoichi; Mitsumori, Naomichi; Maeda, Sadayuki; and Takaya, Masahiro, 4,490,292, Cl. 260-239.30B.
Mittag, Thomas: *See*—
Podos, Steven; Serle, Janet B.; and Mittag, Thomas, 4,490,379, Cl. 424-262.000.
Mitutoyo Mfg. Co., Ltd.: *See*—
Mizuno, Ichiro; and Sugizaki, Iwao, 4,489,496, Cl. 33-172.00R.
Miura, Masao: *See*—
Iwai, Tadashi; Mizuno, Hisayuki; and Miura, Masao, 4,490,344, Cl. 423-341.000.
Miwa, Akihiko: *See*—
Komorizono, Junichi; and Miwa, Akihiko, 4,489,556, Cl. 60-585.000.
Miyaji, Mikio: *See*—
Fujikawa, Kanichi; Tsujii, Yasuhiro; Shigehara, Itaru; Isogai, Tatsuo; Yoshizawa, Hiroshi; and Miyaji, Mikio, 4,490,534, Cl. 546-345.000.
Miyakawa, Seii: *See*—
Hasegawa, Hiroshi; Tsutsui, Yoshitaka; Horikawa, Yoshinori; and Miyakawa, Seii, 4,489,993, Cl. 312-7.200.
Miyasaka, Masao: *See*—
Monma, Hisayoshi; Miyasaka, Masao; and Kubo, Kazuyuki, 4,490,058, Cl. 400-146.000.
Miyata, Akira: *See*—
Ueda, Kohichi; Kamimoto, Shigemi; and Miyata, Akira, 4,490,809, Cl. 364-900.000.
Miyata, Ichiro: *See*—
Yamada, Sohei; and Miyata, Ichiro, 4,489,927, Cl. 269-137.000.
Miyauchi, Terukatsu; Ikeda, Yoneichi; and Kikuchi, Tatsuji, to Terukatsu Miyauchi. Process for thermal cracking of heavy petroleum oils. 4,490,243, Cl. 208-127.000.
Miyazaki, Yoshifumi: *See*—
Matsumoto, Hirofumi; Fujiwara, Masakatu; Tsuchida, Yasuyuki; and Miyazaki, Yoshifumi, 4,490,127, Cl. 474-110.000.
Mizuhara, Howard, to GTE Products Corporation. Ductile nickel based brazing alloy foil. 4,490,437, Cl. 428-606.000.
Mizuno, Hisayuki: *See*—
Iwai, Tadashi; Mizuno, Hisayuki; and Miura, Masao, 4,490,344, Cl. 423-341.000.
Mizuno, Ichiro; and Sugizaki, Iwao, to Mitutoyo Mfg. Co., Ltd. Dial gauge. 4,489,496, Cl. 33-172.00R.
Mizuno, Tsutomu; and Kusaka, Hiroyuki, to Iwatani Sangyo Kabushiki Kaisha. Method for effecting hydrogen sorption and dissociation on an adsorbent metal. 4,490,348, Cl. 423-645.000.
Mobay Chemical Corporation: *See*—
Allen, Gary F.; and Pantone, Richard S., 4,490,300, Cl. 260-453.0SP.
Ma, Eric C.; and Rieck, James N., 4,490,302, Cl. 260-453.0AM.
Pantone, Richard S.; and Reiff, Helmut F., 4,490,301, Cl. 260-453.0SP.
Moberg, Per-Ingvar: *See*—
Forsberg, Lennart G. K.; and Moberg, Per-Ingvar, 4,490,247, Cl. 209-20.000.
Mobil Oil Corporation: *See*—
Chang, Clarence D.; and Pelrine, Bruce P., 4,490,565, Cl. 568-798.000.
Chang, Clarence D.; and Pelrine, Bruce P., 4,490,566, Cl. 568-798.000.
Chou, Tai-Sheng, 4,490,241, Cl. 208-75.000.
Chu, Yung F.; and Chester, Arthur W., 4,490,569, Cl. 585-415.000.
Heilweil, Israel J., 4,490,261, Cl. 252-8.50A.
Oleck, Stephen M.; and Wilson, Robert C., Jr., 4,490,242, Cl. 208-97.000.
Savins, Joseph G., 4,489,984, Cl. 299-5.000.
Shu, Winston R., 4,489,783, Cl. 166-272.000.
Valyocsik, Ernest W., 4,490,342, Cl. 423-328.000.
Mobile Mark, Inc.: *See*—
Kowols, Gilbert J., 4,490,727, Cl. 343-895.000.
Mode, Duane, to Champion International Corporation. Auto-divide carton with unequal cells. 4,489,878, Cl. 229-27.000.
Mode, Duane R., to Champion International Corporation. Multi-compartmented food serving tray and blank therefor. 4,489,879, Cl. 229-27.000.

Modlin, Phillip R.: *See*—
Rounioe, William A.; and Modlin, Phillip R., 4,490,722, Cl. 343-394.000.
Moench, Jerry D.; and Miller, Frank A., to Motorola, Inc. Schmitt trigger circuit. 4,490,627, Cl. 307-290.000.
Moffatt, E. Marston, to United Technologies Corporation. Capacitive pressure transducer. 4,490,773, Cl. 361-283.000.
Mogi, Toshio, to Kabushiki Kaisha Welwod; and Kabushiki Kaisha Takeuchi Sangyo. Tape recorder. 4,490,757, Cl. 360-94.000.
Moissonnier, Gerard, to Pierre Bonnabaud Sarl. Device permitting the control of the flexion of a defective limb of a handicapped person which is fitted with an orthopaedic appliance for its support and articulation. 4,489,717, Cl. 128-80.00F.
Molecular Devices Corporation: *See*—
McConnell, Harden M., 4,490,216, Cl. 204-1.00T.
Molins PLC: *See*—
Bolt, Reginald C., 4,489,736, Cl. 131-282.000.
Mollison, Alistair N., to Du Pont Canada Inc. Nylon film with improved slip characteristics and process therefor. 4,490,324, Cl. 264-211.000.
Molnar, Otto, to Bakke Industries Limited. Sequential blasting system. 4,489,655, Cl. 102-217.000.
Momono, Masakichi, to Hitachi, Ltd. Electromagnetic fuel injector. 4,489,891, Cl. 239-585.000.
Mona Industries, Inc.: *See*—
Corti, Miguel; and Mayhew, Raymond L., 4,490,536, Cl. 548-112.000.
Monarch Marking Systems, Inc.: *See*—
Makley, James A., 4,490,206, Cl. 156-384.000.
Mistyurik, John D., 4,490,060, Cl. 400-617.000.
Momma, Hisayoshi; Miyasaka, Masao; and Kubo, Kazuyuki, to Hitachi Koki Co., Ltd. Line printer and type carrier for use therein. 4,490,058, Cl. 400-146.000.
Monsanto Company: *See*—
Hobbs, Charles F., 4,490,477, Cl. 502-243.000.
Wygant, James C., 4,490,528, Cl. 544-190.000.
Montada, Benjamin V. Syringe filling device. 4,489,766, Cl. 141-27.000.
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Gogniat, Paul, 4,490,052, Cl. 368-292.000.
Monzini, Renato. Motor vehicle with trapezoidal passenger compartment and compact seating arrangement. 4,489,972, Cl. 296-64.000.
Moore, Diane E.; Reyes, Jaime M.; and Munteanu, Eugen, to Energy Conversion Devices, Inc. Thermoelectric device and method of making and using same. 4,489,742, Cl. 136-203.000.
Moore, Geoffrey P. M.: *See*—
Panaretto, Basil A.; Moore, Geoffrey P. M.; and Robertson, Duncan M., 4,490,365, Cl. 424-177.000.
Moore, Lyman T.: *See*—
Turban, Martin M.; Moore, Lyman T.; and Travers, Mark D., 4,490,824, Cl. 373-93.000.
Moore, Richard P., to Blue Circle Projects (Proprietary) Limited. Mechanical conditioning and flocculation of liquids. 4,490,260, Cl. 210-738.000.
Moore, Robert G.; Simpson, Anthony Y.; and Keefe, Howard W., to Textron Inc. Surface effect ship seals. 4,489,667, Cl. 114-67.00A.
Moore, William H.; and Kessler, Harry H. Method of melting and refining steel and other ferrous alloys. 4,490,172, Cl. 75-58.000.
Moorhead, Albert B. Snake trap. 4,489,516, Cl. 43-7.000.
Moos, Kurt: *See*—
Buschor, Karl; Giesinger, Hans; and Moos, Kurt, 4,489,749, Cl. 137-487.500.
Morell, Josef: *See*—
Freudenschuss, Otto; Morell, Josef; Rollenitz, Leopold; and Schmidt, Harald, 4,490,098, Cl. 417-499.000.
Morgan, Thomas W.: *See*—
Gage, Charles A.; Blair, Timothy T.; and Morgan, Thomas W., 4,490,033, Cl. 355-16.000.
Mori, Tetsuo: *See*—
Dietrich, Bernhard; Matsushita, Hidetoshi; and Mori, Tetsuo, 4,490,701, Cl. 335-78.000.
Mori, Toshihiro; Imai, Yoshifumi; Matsui, Masanori; and Masumura, Masao, to Jeco Co., Ltd. Apparatus for preventing arc discharge of transfer switch circuit for inductive load. 4,490,768, Cl. 361-2.000.
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Suzuki, Shohei; Kazawa, Yoshiaki; Saito, Ryusei; Noguchi, Koji; Moriai, Hidezumi; Mashiko, Ryoichi; and Sakai, Shuji, 4,490,578, Cl. 174-15.00S.
Moribe, Yoshihiro; Hayashi, Yukitaka; and Mitamura, Masahiro, to Hitachi, Ltd. Positioning method and apparatus therefor. 4,490,662, Cl. 318-685.000.
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Moriguchi, Haruhiko, to Fuji Xerox Co., Ltd. Image input/output device. 4,490,746, Cl. 358-286.000.
Moriguchi, Yutaro: *See*—
Honda, Makoto; Izawa, Akira; and Moriguchi, Yutaro, 4,490,010, Cl. 350-128.000.
Morimoto, Mikio, to Nippon Electric Co., Ltd. Surface acoustic wave bandpass filter. 4,490,698, Cl. 333-193.000.
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Takiyama, Eiichiro; Tsukui, Toshikazu, deceased; Morita, Katsuhisa; and Takano, Seiichi, 4,490,410, Cl. 427-44.000.
Morita, Ken-ichi: *See*—
Fukuhara, Mototada; Ono, Keizo; Morita, Ken-ichi; and Fujii, Shigeru, 4,490,828, Cl. 373-117.000.
Morita, Takayuki; and Tsunekawa, Takahiko, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method of piecing yarns in a spinning machine utilizing an air stream. 4,489,544, Cl. 57-261.000.
Morizzo, Nicholas L., to Krantz America, Inc. Apparatus for automatically cutting and winding sheet material. 4,489,900, Cl. 242-56.00R.
Morong, William H., III. Apparatus and method for determining the number of turns on a sample coil. 4,490,671, Cl. 324-55.000.
Morozova, Nadezhda A.: *See*—
Shamarokov, Alexandr S.; Kuzmin, Alexei V.; Glebov, Vladimir P.; Moskvichev, Viktor F.; Morozova, Nadezhda A.; Filippov, Gennady A.; Tarankov, Gennady A.; Lukasevich, Boris I.; Andreev, Leonid M.; and Grishakov, Viktor I., 4,489,788, Cl. 122-32.000.
Morris, Henrietta K.; and Lagergren, Esther R., to Surgikos, Inc. Cesarean section surgical drape. 4,489,720, Cl. 128-132.00D.
Morrison, Terry, to Chandler Evans Inc. Adaptive gas turbine acceleration control. 4,490,791, Cl. 364-431.020.
Morrisroe, John P. Artificial seaweed and method of accreting waterfronts. 4,490,071, Cl. 405-24.000.
Morrissey, Neal J.: *See*—
Turner, Peter J.; and Morrissey, Neal J., 4,489,897, Cl. 241-167.000.
Morrow, Winston G., to Spinal Dynamics, Inc. Pelvic support method and means. 4,489,982, Cl. 297-458.000.
Mortoly, John L., to James L. Taylor Mfg. Co. Equalizer clamp. 4,489,925, Cl. 269-71.000.
Moses, Peter R.; and Bowden, William L., to Duracell Inc. Cell solvent. 4,490,449, Cl. 429-196.000.
Moskvichev, Viktor F.: *See*—
Shamarokov, Alexandr S.; Kuzmin, Alexei V.; Glebov, Vladimir P.; Moskvichev, Viktor F.; Morozova, Nadezhda A.; Filippov, Gennady A.; Tarankov, Gennady A.; Lukasevich, Boris I.; Andreev, Leonid M.; and Grishakov, Viktor I., 4,489,788, Cl. 122-32.000.
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Mostek Corporation: *See*—
Guterman, Daniel C., 4,490,812, Cl. 364-900.000.
Mostert, Johann, to Schumag GmbH, Firma. Method for straightening drawn round stock and apparatus for the practice of the method. 4,489,582, Cl. 72-98.000.
Motherwell, William B.: *See*—
Barton, Derek H. R.; Motherwell, William B.; and Zard, Samir Z., 4,490,296, Cl. 260-397.400.
Motorola, Inc.: *See*—
Borras, Jaime A.; Suarez, Jose I.; and Victor, Alan M., 4,490,688, Cl. 331-1.00A.
Buchwald, Gregory J., 4,490,837, Cl. 381-15.000.
Deutsch, Robert W.; and Martinsons, Robert, 4,490,792, Cl. 364-431.070.
Epsom, Robert L.; and Gailus, Paul H., 4,490,684, Cl. 330-149.000.
Gasparaitis, Bernard V.; Krieg, Larry M.; Schweet, Richard R.; Williams, William R.; and Burbank, Raymond W., 4,490,813, Cl. 365-63.000.
Martinsons, Robert, 4,490,804, Cl. 364-571.000.
Miniet, Jay J., 4,489,999, Cl. 339-17.0CF.
Moench, Jerry D.; and Miller, Frank A., 4,490,627, Cl. 307-290.000.
Noufer, Glenn E.; and Donoghue, William J., 4,490,633, Cl. 307-475.000.
Williamson, Thomas R., III, 4,490,448, Cl. 429-194.000.
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Cabrit, Philippe; Mourlevat, Jean; and de Saint-Palais, Jacques, 4,489,472, Cl. 29-426.500.
Mowe, Wayne T.: *See*—
Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,489,543, Cl. 57-208.000.
Moya, Francois, to Quantel S.A. Optical filtering element and a spectral refining device including the same. 4,490,021, Cl. 350-162.230.
Mrozowski, Andrij; and Prazak, Paul R., to Burr-Brown Inc. Microprocessor supervised analog-to-digital converter. 4,490,713, Cl. 340-347.0AD.
Mueller Co.: *See*—
Daghe, Joseph L.; Sands, Robert E.; and Humes, Dennis W., 4,489,746, Cl. 137-218.000.
Mueller, Erwin, to Siemens Aktiengesellschaft. Electromagnetic relay. 4,490,705, Cl. 335-276.000.
Mueller, Francis E.: *See*—
Dost, Martin H.; Liu, Chung C.; and Mueller, Francis E., 4,490,756, Cl. 360-77.000.
Muller, Gerhard: *See*—
Engelfried, Werner; and Muller, Gerhard, 4,489,573, Cl. 66-8.000.
Muller, Klaus: *See*—
Linder, Ernst; Maurer, Helmut; and Muller, Klaus, 4,489,596, Cl. 73-116.000.
Mullersman, Ferdinand H., to General Electric Company. System and circuit for charging a rechargeable battery. 4,490,667, Cl. 320-48.000.
Mullich, Richard O.; and Dushane, Ray, to TRE Corporation. Deadbolt assembly. 4,489,576, Cl. 70-134.000.
Mulvey, Dennis M.: *See*—
Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,490,374, Cl. 424-251.000.

Mumme-Young, Colin A.: *See*—
Cooper, John; and Mumme-Young, Colin A., 4,490,194, Cl. 149-2.000.
Cooper, John; Reid, David S.; Mumme-Young, Colin A.; and Gregson, Robert D., 4,490,195, Cl. 149-2.000.
Munson, Robert E.: *See*—
Stockton, Ronald J.; and Munson, Robert E., 4,490,721, Cl. 343-368.000.
Munson, Verne E., to AT&T Information Systems Inc. Speakerphone control circuit. 4,490,582, Cl. 179-81.00B.
Munteanu, Eugen: *See*—
Moore, Diane E.; Reyes, Jaime M.; and Munteanu, Eugen, 4,489,742, Cl. 136-203.000.
Murakami, Kazuhito; and Takahashi, Kenichi, to Sumitomo Electric Industries, Ltd. Infrared fibers. 4,490,008, Cl. 350-96.340.
Murakami, Nobuaki: *See*—
Kinoshita, Mitsutaka; Nakagami, Tatsuro; Murakami, Nobuaki; Endo, Norio; Tamura, Fumio; and Danno, Yoshiaki, 4,489,685, Cl. 123-198.00F.
Murashko, Evgeny T.: *See*—
Davidovich, Alexandr N.; Schukin, Valery Y.; Klushin, Valery A.; Sadko, Vladimir I.; Skrebets, Nikolai M.; and Murashko, Evgeny T., 4,489,581, Cl. 72-70.000.
Murata, Hisashi, to Nippon Telegraph & Telephone Public Corp. Optical fiber alignment mechanism and connectors using the same. 4,490,007, Cl. 350-96.210.
Muroran Institute of Technology: *See*—
Watabe, Tomiji; Kondo, Hideo; Matsuda, Toshihiko; Yano, Kenji; Dote, Yasuhiko; and Takagi, Matao, 4,490,621, Cl. 290-42.000.
Murr, Lawrence E.: *See*—
Hare, Alan W.; Murr, Lawrence E.; and Carlson, F. Paul, 4,490,329, Cl. 419-51.000.
Murray, Michael J.: *See*—
Meyer, Leonard S.; Murray, Michael J.; Hayes, Gerald G.; and McClain, Robert L., 4,489,876, Cl. 228-170.000.
Muruman Golf Kabushiki Kaisha: *See*—
Kobayashi, Masashi, 4,489,945, Cl. 273-167.00H.
Musikant, Barry L.: *See*—
Deutsch, Allan S.; and Musikant, Barry L., 4,490,116, Cl. 433-215.000.
Mussig, Bernhard: *See*—
Hentschel, Karl-Heinz; Mussig, Bernhard; Dhein, Rolf; and Kussi, Siegfried, 4,490,266, Cl. 252-49.800.
Mycynek, Victor; and Rypkema, Jouke N., to Zenith Electronics Corporation. Intercarrier signal detection circuit for a television receiver. 4,490,743, Cl. 358-197.000.
Myers, Jay E.; and Myers, M. Todd. Hanging bag with detachable cowl. 4,489,829, Cl. 206-287.000.
Myers, M. Todd: *See*—
Myers, Jay E.; and Myers, M. Todd, 4,489,829, Cl. 206-287.000.
Myrick, Charles C., to Boeing Company, The. Angle of airflow vane positioner. 4,489,591, Cl. 73-1.00E.
N. A. Taylor Company, Inc.: *See*—
Hamilton, W. Duane, 4,489,955, Cl. 280-242.0WC.
N. V. Raychem S.A.: *See*—
Francxx, Joris R. L., 4,490,426, Cl. 428-99.000.
Naaktgeboren, Adrianus, to Sperry Corporation. Baler density control mechanism. 4,489,648, Cl. 100-191.000.
Nabisco Brands, Inc.: *See*—
Albrecht, Robert J.; Ignatuk, Daniel; Pinto, Albert A.; and Simeluas, William J., 4,489,632, Cl. 83-404.200.
Horwath, Robert O., 4,490,466, Cl. 435-22.000.
Nablo, Sam, to Energy Sciences, Inc. Process and apparatus for decorating the surfaces of electron irradiation cured coatings on radiation-sensitive substrates. 4,490,409, Cl. 427-44.000.
Nagai, Hisao: *See*—
Abe, Mitsuo; Nagai, Hisao; and Kamiya, Akira, 4,490,507, Cl. 525-263.000.
Nagai, Koichi: *See*—
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Ishiguro, Ken; Nagai, Koichi; and Hata, Kunio, 4,490,435, Cl. 428-341.000.
Nagai, Shunichi; and Hiramura, Kazuo, to Kabushiki Kaisha Komatsu Seisakusho. Slide stop position control apparatus of a press. 4,489,578, Cl. 72-21.000.
Nagano, Riichiro; and Sagane, Toshihiro, to Mitsui Petrochemical Industries, Ltd. Graft-modified copolymer and compounding agent for styrene-type polymer containing the same. 4,490,508, Cl. 525-316.000.
Nagase, Masaomi: *See*—
Ono, Hironobu; Nakano, Jiro; and Nagase, Masaomi, 4,489,691, Cl. 123-424.000.
Nagashima, Kunio, to Nippon Electric Co., Ltd. Subscriber line circuit comprising a controllable DC/DC converter as a battery feed circuit. 4,490,580, Cl. 179-18.0FA.
Nagatsuma, Kazuyuki: *See*—
Takeuchi, Hiroshi; Jyo mura, Shigeru; Nagatsuma, Kazuyuki; Hikita, Mitsutaka; Ito, Yukio; and Ashida, Sakichi, 4,490,641, Cl. 310-366.000.
Nakada, Akio: *See*—
Matsuo, Kazumasa; and Nakada, Akio, 4,489,727, Cl. 128-660.000.
Matsuo, Kazumasa; and Nakada, Akio, 4,489,728, Cl. 128-660.000.
Nakae, Kiyohiko: *See*—
Fukushima, Nobuo; Nakae, Kiyohiko; and Terazawa, Takayuki, 4,490,502, Cl. 524-445.000.
Nakagami, Kashiro, to Isolite Babcock Refractories, Co., Ltd. Method for installing thermal insulation materials on the inner surface of a duct. 4,489,473, Cl. 29-451.000.
Nakagami, Tatsuro: *See*—
Kinoshita, Mitsutaka; Nakagami, Tatsuro; Murakami, Nobuaki; Endo, Norio; Tamura, Fumio; and Danno, Yoshiaki, 4,489,685, Cl. 123-198.00F.
Nakai, Taiichiro; Furusawa, Kahei; Sato, Masanori; Niiro, Yasuhiko; Ejiri, Yoshihiro; and Nunokawa, Makoto, to Kokusai Denshin Denwa Kabushiki Kaisha. Optical fiber submarine cable. 4,490,009, Cl. 350-96.230.
Nakamats, Yoshiro. Diskette for cleaning a floppy-disc drive head. 4,490,765, Cl. 360-133.000.
Nakanishi Dental Mfg. Co., Ltd.: *See*—
Kawada, Shosaku, 4,490,113, Cl. 433-104.000.
Nakano, Fumio: *See*—
Maekawa, Iwao; Omori, Eiji; Uchigasaki, Isao; Tobita, Hideyuki; Yokoyama, Naoki; Tanno, Seikichi; Nakano, Fumio; and Ito, Ren, 4,490,496, Cl. 524-317.000.
Nakano, Jiro: *See*—
Ono, Hironobu; Nakano, Jiro; and Nagase, Masaomi, 4,489,691, Cl. 123-424.000.
Nakano, Takuo: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Minami, Tamotsu; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,490,393, Cl. 424-263.000.
Nakatani, Shoji, to Fujitsu Limited. Vector processing unit. 4,490,786, Cl. 364-200.000.
Nakayama, Koji: *See*—
Shimada, Katsuhiko; Nakayama, Koji; Sato, Tatsuo; and Saito, Kazuo, 4,490,077, Cl. 406-14.000.
Nakayama, Toyoo: *See*—
Fujii, Setsuro; Aoyama, Takuo; Sakurai, Yojiro; Nakayama, Toyoo; Nunomura, Shigeki; Yaegashi, Takashi; and Okutome, Toshiyuki, 4,490,388, Cl. 424-278.000.
Nalco Chemical Company: *See*—
Fong, Dodd W.; and Kowalski, David J., 4,490,308, Cl. 260-513.00N.
Nally, Robert B.; Akister, James F.; Leung, Patrick C.; and Vance, Eric J., to NCR Corporation. Matrix character recognition. 4,490,850, Cl. 382-34.000.
Nally, Robert B.; Vance, Eric J.; Leung, Patrick C.; and Akister, James F., to NCR Corporation. Matrix character reading system. 4,490,853, Cl. 382-48.000.
Nancarrow, James N.: *See*—
Cholvin, Robert L.; McInerney, Charles E.; Nancarrow, James N.; and Gantz, Jack L., 4,489,702, Cl. 123-564.000.
Narayan, Thirumurti: *See*—
Patton, John T., Jr.; Narayan, Thirumurti; and Dumas, Louis H., 4,490,490, Cl. 521-177.000.
Narita, Hiroshi: *See*—
Tanamachi, Tokunosuke; Narita, Hiroshi; Ibamoto, Masahiko; and Okamatsu, Shigetoshi, 4,490,666, Cl. 318-800.000.
Narita, Kou: *See*—
Haraguchi, Hiroshi; Narita, Kou; Iwata, Toshiharu; and Baba, Yasutoshi, 4,489,692, Cl. 123-425.000.
Naruse, Kazuaki: *See*—
Ishida, Tsuyoshi; Osawa, Hideo; and Naruse, Kazuaki, 4,490,846, Cl. 382-7.000.
Nathrath, Norbert: *See*—
Hausler, Peter; and Nathrath, Norbert, 4,489,564, Cl. 62-48.000.
National Research Development Corporation: *See*—
Aleksander, Igor; Stonham, Thomas J.; and Wilkie, Bruce A., 4,490,847, Cl. 382-10.000.
Burdess, James S.; and Maunder, Leonard, 4,489,609, Cl. 73-505.000.
Marchant, John A.; and Hughes, John F., 4,489,894, Cl. 239-693.000.
National Semiconductor Corporation: *See*—
Kung, David, 4,490,631, Cl. 307-456.000.
Nausedas, Joseph A., to Union Carbide Corporation. Stuffing method and apparatus. 4,489,460, Cl. 17-49.000.
Nawy, Albert A.: *See*—
Bigbie, Samuel E.; Cavill, Barry R.; Dodgen, David F.; and Nawy, Albert A., 4,490,796, Cl. 364-515.000.
NCR Corporation: *See*—
Nally, Robert B.; Akister, James F.; Leung, Patrick C.; and Vance, Eric J., 4,490,850, Cl. 382-34.000.
Nally, Robert B.; Vance, Eric J.; Leung, Patrick C.; and Akister, James F., 4,490,853, Cl. 382-48.000.
Reece, John W., 4,490,057, Cl. 400-124.000.
Sahni, Ram N., 4,490,852, Cl. 382-48.000.
Neargarder, Marvin L.: *See*—
Bolton, David R.; Koverman, Charles A.; and Neargarder, Marvin L., 4,489,872, Cl. 226-117.000.
Nebelung, Hermann H.; and Knoth, Werner-Dieter, to Emhart Industries, Inc. Mould arrangement for use in a glassware container manufacturing machine. 4,490,164, Cl. 65-263.000.
Neberle, Klaus: *See*—
Cappel, Bert; Diefflipp, Kurt; Emrich, Helmut; Erbach, Horst; Feldt, Wolfgang; Neberle, Klaus; and Ochs, Heinrich, 4,489,653, Cl. 101-415.100.
NEC Corporation: *See*—
Otsuka, Shigeru, 4,490,818, Cl. 370-26.000.
Neely, Morrell. Sheet tent. 4,489,451, Cl. 5-414.000.

Nehezvegyipari Kutato Intezet: *See—*
Besan, Janos; Kovacs, Miklos; Kulcsar, Laszlo; Maier, Ferenc; and Pernyeszi, Jozsef, 4,490,539, Cl. 548-262.000.
Nehring, John R., to Davol, Inc. Pressure operated pulsatile fluid flow device. 4,489,750, Cl. 137-496.000.
Nelson, Eric L.; and Harris, Richard L., to Nelson Research & Development Co. Contact lens preserving solution containing ascorbic acid or salts thereof. 4,490,389, Cl. 424-280.000.
Nelson, Leonard: *See—*
Barresi, Anthony J.; Nelson, Leonard; and Pogson, Jack, 4,489,923, Cl. 269-8.000.
Nelson, Nyal E., to United States of America, Army. Environmentally adaptable roof structure. 4,489,531, Cl. 52-741.000.
Nelson Research & Development Co.: *See—*
Nelson, Eric L.; and Harris, Richard L., 4,490,389, Cl. 424-280.000.
Netter, Gastos; and Widjaja, Injas, to Erno Raumfahrttechnik GmbH/MBB. Fuel tank for use in a low-gravity environment. 4,489,745, Cl. 137-209.000.
Neuman, Eli; and Davis, C. Paul, to Perfectdata Corporation. Manually operated conditioner for flexible magnetic disks. 4,490,767, Cl. 360-137.000.
Neuroth, David H., to Harvey Hubbell Incorporated. Electrical cable for use in extreme environments. 4,490,577, Cl. 174-103.000.
Newcome, Bruce H.: *See—*
Enke, Christie G.; Newcome, Bruce H.; and Holland, John F., 4,490,806, Cl. 364-734.000.
NGK Insulators, Ltd.: *See—*
Ogawa, Yutaka; Yamada, Shunichi; and Hamanaka, Toshiyuki, 4,489,774, Cl. 165-10.000.
Nicastro, Hector M. Multisized fastener driving tool. 4,489,628, Cl. 81-185.000.
Nicco Machine Tool Company, Ltd.: *See—*
Kuromatsu, Akio, 4,490,158, Cl. 51-293.000.
Nicia, Antonius J. A.: *See—*
Jochem, Cornelis M. G.; Khoe, Giok D.; and Nicia, Antonius J. A., 4,490,163, Cl. 65-4.210.
Nickel, Herbert W., to A. O. Smith Corporation. Self-leveling base for tank. 4,489,846, Cl. 220-69.000.
Nickles, Richmond H.: *See—*
Hennings, George N.; Nickles, Richmond H.; Brauer, Larry F.; and DeHarrold, Raymond H., 4,489,656, Cl. 102-254.000.
Nielsen, Corine M.: *See—*
Lunder, Tito L.; and Nielsen, Corine M., 4,490,402, Cl. 426-422.000.
Niiro, Yasuhiko: *See—*
Nakai, Taiichiro; Furusawa, Kahei; Sato, Masanori; Niiro, Yasuhiko; Ejiri, Yoshihiro; and Nunokawa, Makoto, 4,490,009, Cl. 350-96.230.
Nippon Electric Co., Ltd.: *See—*
Hareyama, Kyuichi, 4,490,634, Cl. 307-573.000.
Ito, Susumu, 4,490,674, Cl. 324-208.000.
Kai, Tomokazu; and Tsuboi, Toshihide, 4,490,830, Cl. 375-40.000.
Morimoto, Mikio, 4,490,698, Cl. 333-193.000.
Nagashima, Kunio, 4,490,580, Cl. 179-18.0FA.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Aoki, Eiichiro; and Higashi, Iwao, 4,489,636, Cl. 84-1.010.
Nippon Kokan Kabushiki Kaisha: *See—*
Shimada, Katsuhiko; Nakayama, Koji; Sato, Tatsuo; and Saito, Kazuo, 4,490,077, Cl. 406-14.000.
Nippon Oil Company, Limited: *See—*
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, 4,490,239, Cl. 208-44.000.
Nippon Paint Co., Ltd.: *See—*
Shindow, Kenji; Uenaka, Akimitsu; Izumo, Takaharu; Fujishima, Teruyoshi; and Yamamoto, Satoshi, 4,490,417, Cl. 427-388.300.
Nippon Petrochemicals Co Ltd.: *See—*
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,489,630, Cl. 83-15.000.
Nippon Piston Ring Co., Ltd.: *See—*
Matsuzaki, Michiyoshi, 4,490,175, Cl. 75-126.00C.
Nippon Soken, Inc.: *See—*
Fukami, Akira; and Okamoto, Kunio, 4,489,603, Cl. 73-337.000.
Kohama, Tokio; Huzino, Seizi; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,489,695, Cl. 123-481.000.
Nippon Telegraph & Telephone Public Corp.: *See—*
Murata, Hisashi, 4,490,007, Cl. 350-96.210.
Nippondenso Co., Ltd.: *See—*
Haraguchi, Hiroshi; Narita, Kou; Iwata, Toshiharu; and Baba, Yasutoshi, 4,489,692, Cl. 123-425.000.
Kato, Masaaki, 4,489,886, Cl. 239-88.000.
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Himuro, Masami; Nishigaki, Susumu; and Terunuma, Kazuhiko, 4,490,739, Cl. 358-66.000.
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Takeshima, Takahiko; Ueki, Tadashi; Kawashima, Motozo; Ueno, Thuneo; and Nishimoto, Masayuki, 4,489,771, Cl. 164-305.000.
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Nishiyama, Masao: *See—*
Ogasa, Masao; Nishiyama, Masao; and Ohtsuki, Kaoru, 4,490,520, Cl. 528-315.000.
Nissan Motor Company, Limited: *See—*
Kamijo, Ken, 4,489,804, Cl. 180-268.000.
Matsui, Tatsuhiko; Aida, Hiroyuki; and Ohnuki, Tomoyoshi, 4,489,967, Cl. 292-339.000.
Tamamushi, Masahiro, 4,489,660, Cl. 108-44.000.
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Niu, Joseph H. Y., to Betz Laboratories Inc. Method and composition for neutralizing acidic components in petroleum refining units. 4,490,275, Cl. 252-189.000.
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Fleming, Ian D.; Noble, David; Noble, Hazel M.; and Wall, Wilfred F., 4,490,294, Cl. 260-245.300.
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Nodwell, Bruce: *See—*
Stevenson, Robert C.; Enright, Michael G.; and Nodwell, Bruce, 4,489,914, Cl. 251-147.000.
Noguchi, Koji: *See—*
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Bosche, Horst G.; Nohe, Heinz; and Pachaly, Heinz, 4,490,214, Cl. 203-6.000.
Nolan, Richard H. Board game. 4,489,947, Cl. 273-271.000.
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Reiffen, Manfred; Heider, Joachim; Hauel, Norbert; Austel, Volkhard; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Noll, Klaus; Pieper, Helmut; Kruger, Gerd; and Keck, Johannes, 4,490,369, Cl. 424-244.000.
Nomura, Hiroshi: *See—*
Kamohara, Hideaki; Imamura, Minoru; Higaki, Hiroshi; Yoshitomi, Yuji; Uno, Syuzo; Makino, Kazuhiro; Nomura, Hiroshi; and Yoshioka, Kyozo, 4,489,659, Cl. 104-124.000.
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Nondahl, Thomas A., to Allen-Bradley Company. Digital power converter. 4,490,780, Cl. 363-87.000.
Northern Telecom Limited: *See—*
Charlebois, Leonard J.; Scott, James R.; and Barber, Robert J., 4,489,830, Cl. 206-316.000.
Charlebois, Leonard J.; and Huszarik, Fred A., 4,490,315, Cl. 264-40.100.
Chik, Kiu-Chi D.; Devenyi, Tibor F.; and Dyment, John C., 4,489,477, Cl. 29-569.00L.
Read, Clifford D.; Dolan, Bruce I.; and McDonald, Paul D., 4,490,604, Cl. 235-146.000.
Ryan, John F.; and Wright, John G., 4,490,087, Cl. 414-417.000.
Northrop Corporation: *See—*
Komine, Hiroshi; and Brosnan, Stephen J., 4,490,823, Cl. 372-95.000.
Norton, Terry L.; and Constantine, Neil V., to Royston Manufacturing Corporation. Cabinet with an external shelf and cup dispenser. 4,489,996, Cl. 312-279.000.
Notch, Donald R.: *See—*
Hull, Warren L.; Leedahl, Wesley C.; and Notch, Donald R., 4,489,470, Cl. 29-157.30C.
Noufer, Glenn E.; and Donoghue, William J., to Motorola, Inc. TTL to CMOS input buffer. 4,490,633, Cl. 307-475.000.
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Taylor, Theodore B., 4,489,565, Cl. 62-59.000.
Novak, Jan: *See—*
Svercl, Josef; Novak, Jan; and Zampach, Stepan, 4,489,588, Cl. 72-402.000.
Nufer, Bruno; and Luchinger, Paul, to Mettler Instrumente AG. Temperature-compensated weighing apparatus. 4,489,800, Cl. 177-212.000.
Numbers, Jody L. Concealable firearm. 4,489,515, Cl. 42-1.00R.
Nunokawa, Makoto: *See—*
Nakai, Taiichiro; Furusawa, Kahei; Sato, Masanori; Niiro, Yasuhiko; Ejiri, Yoshihiro; and Nunokawa, Makoto, 4,490,009, Cl. 350-96.230.
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Fujii, Setsuro; Aoyama, Takuo; Sakurai, Yojiro; Nakayama, Toyoo; Nunomura, Shigeki; Yaegashi, Takashi; and Okutome, Toshiyuki, 4,490,388, Cl. 424-278.000.

Nussbaumer, Dietmar; Perl, Horst; and Vinh, Khuong T., to Sartorius GmbH. Apparatus for static membrane filtration. 4,490,256, Cl. 210-359.000.
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Degn, Kaj; and Waldstrom, Ejvind, 4,489,536, Cl. 53-450.000.
Oakley, John R., to Metal Box P.L.C. Forming cartons. 4,490,129, Cl. 493-8.000.
Obayashi, Hideki: *See*—
Kohama, Tokio; Huzino, Seizi; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,489,695, Cl. 123-481.000.
Occidental Chemical Corporation: *See*—
Kosanovich, George M.; and Salee, Gideon, 4,490,519, Cl. 528-179.000.
Miller, George T., 4,490,352, Cl. 424-17.000.
Occidental Oil Shale, Inc.: *See*—
Ricketts, Thomas E., 4,489,983, Cl. 299-2.000.
Ochii, Kiyofumi: *See*—
Yasuda, Hiroshi; and Ochii, Kiyofumi, 4,490,697, Cl. 333-156.000.
Ochs, Heinrich: *See*—
Cappel, Bert; Difflipp, Kurt; Emrich, Helmut; Erbach, Horst; Feldt, Wolfgang; Neberle, Klaus; and Ochs, Heinrich, 4,489,653, Cl. 101-415.100.
O'Donnell, Timothy W.: *See*—
Olson, Daniel R.; and O'Donnell, Timothy W., 4,490,774, Cl. 361-311.000.
Ogasa, Masao; Nishiyama, Masao; and Ohtsuki, Kaoru, to UBE Industries, Ltd. Process for preparing impact-resistant polyamides. 4,490,520, Cl. 528-315.000.
Ogasawara, Tadahiko, to Olympus Optical Co., Ltd. Washing apparatus for an endoscope. 4,489,741, Cl. 134-179.000.
Ogata, Yasuhiro: *See*—
Maekawa, Masakazu; and Ogata, Yasuhiro, 4,490,732, Cl. 346-200.000.
Ogawa, Iwakichi, to Takara Co., Ltd. Running toy. 4,490,124, Cl. 446-464.000.
Ogawa, Kyosuke: *See*—
Misumi, Teruo; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Shirai, Shigeru, 4,490,454, Cl. 430-84.000.
Ogawa, Yutaka; Yamada, Shunichi; and Hamanaka, Toshiyuki, to NGK Insulators, Ltd. Rotary cordierite heat regenerator highly gas-tight and method of producing the same. 4,489,774, Cl. 165-10.000.
Ogura, Daisuke; and Fujiu, Shosuke, to Toshiba Kikai Kabushiki Kaisha; and Toppan Printing Co. Ltd. Paper folding machines for use in rotary presses. 4,490,132, Cl. 493-424.000.
Ogura, Mitsugi, to Tokyo Shibaura Denki Kabushiki Kaisha. MOS Decoder selection circuit having a barrier transistor whose non-conduction period is unaffected by substrate potential disturbances. 4,490,628, Cl. 307-449.000.
Oguri, Yasuo; Awata, Mitsuru; Saito, Junji; Inoue, Soichi; and Ariyama, Noriyuki, to Mitsubishi Chemical Industries Ltd. Process for preparing a calcium silicate shaped product. 4,490,320, Cl. 264-82.000.
O'Hara, Mark J.; and Imai, Tamotsu, to UOP Inc. Oligomerization of olefins. 4,490,571, Cl. 585-525.000.
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Ohshima, Yutaka, to Olympus Optical Co., Ltd. Endoscope with a gas/liquid switching mechanism. 4,489,712, Cl. 128-6.000.
Ohtsuka, Junji, to Eagle Industry Co., Ltd. Mechanical seal. 4,489,952, Cl. 277-96.200.
Ohtsuka, Mitsugi: *See*—
Tsuda, Tadashi; Hiramatsu, Seiichirou; Maeno, Tsuyoshi; and Ohtsuka, Mitsugi, 4,490,716, Cl. 340-904.000.
Ohtsuki, Kaoru: *See*—
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Ohya, Masayuki; and Inou, Masaaki, to Fujitsu Limited. STO Stack control system. 4,490,787, Cl. 364-200.000.
Ohyo Jiki Lab. Co.: *See*—
Kuromatsu, Akio, 4,490,158, Cl. 51-293.000.
Okabe, Nobuya, to Hitachi Construction Machinery Co., Ltd. Universal lever apparatus for hydraulic construction machine. 4,489,805, Cl. 180-271.000.
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hiroshi, to Nippon Petrochemicals Co Ltd.; and Polymer Processing Research Institute Ltd. Method and apparatus for slitting thermoplastic films. 4,489,630, Cl. 83-15.000.
Okada, Yoji: *See*—
Kamiyama, Shuichi; and Okada, Yoji, 4,490,663, Cl. 318-696.000.
Okamatsu, Shigetoshi: *See*—
Tanamachi, Tokunosuke; Narita, Hiroshi; Ibamoto, Masahiko; and Okamatsu, Shigetoshi, 4,490,666, Cl. 318-800.000.
Okamoto, Kunio: *See*—
Fukami, Akira; and Okamoto, Kunio, 4,489,603, Cl. 73-337.000.
Okazaki, Michio, to Diesel Kiki Co., Ltd. Rotary vane-type compressor with discharge passage in rotor. 4,490,100, Cl. 418-98.000.
Okazaki, Yutaka: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Minami, Tamotsu; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,490,393, Cl. 424-263.000.
Okudaira, Sadao; and Sato, Shigetada, to Asahi Kogaku Kogyo Kabushiki Kaisha. High-speed zoom lens. 4,490,017, Cl. 350-427.000.
Okutome, Toshiyuki: *See*—
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O'Leary, Raymond P., to S&C Electric Company. Explosively-actuated, multi-gap high voltage switch. 4,490,707, Cl. 337-6.000.
Oleck, Stephen M.; and Wilson, Robert C., Jr., to Mobil Oil Corporation. Two-stage hydrocarbon dewaxing hydrotreating process. 4,490,242, Cl. 208-97.000.
Olin Corporation: *See*—
Browne, James H.; Ward, Robert H.; and Albus, Frank E., 4,489,503, Cl. 34-10.000.
Fuzesi, Stephen; and Brown, Robert W., 4,490,517, Cl. 527-401.000.
Fuzesi, Stephen; and Brown, Robert W., 4,490,518, Cl. 527-401.000.
Kadija, Igor V.; and Oxley, James E., 4,490,218, Cl. 204-13.000.
Oliver, Melvin D. Telephone ear piece lock. 4,490,586, Cl. 179-189.00R.
Ollinger, James C.; and Shaub, Melvin H., to Armstrong World Industries, Inc. Reinforced ceiling runner. 4,489,529, Cl. 52-732.000.
Olmstead, Harold W., to Tektronix, Inc. Deflection systems and ramp generators therefor. 4,490,653, Cl. 315-403.000.
Olofsson, Gunnar: *See*—
Kumbrant, Lars; Olofsson, Gunnar; and Larsson, Mats, 4,489,604, Cl. 73-432.00R.
Olson, Daniel R.; and O'Donnell, Timothy W., to General Electric Company. Capacitors containing polyfunctional acrylate polymers as dielectrics. 4,490,774, Cl. 361-311.000.
Olson, Paul E., to American Standard Inc. Door operating apparatus. 4,489,640, Cl. 91-189.00R.
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Matsuo, Kazumasa; and Nakada, Akio, 4,489,727, Cl. 128-660.000.
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Ohshima, Yutaka, 4,489,712, Cl. 128-6.000.
Omicron Technology Corporation: *See*—
Pieters, Wim J.M.; and Gates, William E., 4,489,593, Cl. 73-38.000.
Omori, Eiji: *See*—
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Ono, Hironobu; Nakano, Jiro; and Nagase, Masaomi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling the ignition timing of an internal combustion engine. 4,489,691, Cl. 123-424.000.
Ono, Keizo: *See*—
Fukuhara, Mototada; Ono, Keizo; Morita, Ken-ichi; and Fujii, Shigeru, 4,490,828, Cl. 373-117.000.
Onodera, Kaoru: *See*—
Iijima, Toshifumi; Onodera, Kaoru; and Fujimatsu, Wataru, 4,490,459, Cl. 430-505.000.
Onomori Iron Works Co., Ltd.: *See*—
Arashi, Masahiro, 4,489,575, Cl. 68-177.000.
Opitz, Charles L.; and Slobodin, Leo, to Lockheed Electronics Co., Inc. Radar apparatus for detecting and/or classifying an agitated reflective target. 4,490,718, Cl. 343-5.0SA.
Opitz, Reinhard: *See*—
Gottwald, Karl-Heinz; and Opitz, Reinhard, 4,490,185, Cl. 148-6.15Z.
Orain, Michel A., to Glaenzer Spicer. Telescopic homokinetic joint. 4,490,126, Cl. 464-111.000.
Oregon Graduate Center for Study and Research: *See*—
Hare, Alan W.; Murr, Lawrence E.; and Carlson, F. Paul, 4,490,329, Cl. 419-51.000.
Orlowski, Jan A.; Butler, David V.; and Kidd, Patrick D., to Scientific Pharmaceutical, Inc. Dental material comprising adducts of 3-methacroyl-2-hydroxypropyl esters with diisocyanates. 4,490,115, Cl. 433-199.000.
Ortho Pharmaceutical Corporation: *See*—
Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,490,374, Cl. 424-251.000.
Ortiz Burgos, Angel A. Board game having consistent shape relationship among its parts. 4,489,946, Cl. 273-249.000.
Osato, Yoichi: *See*—
Misumi, Teruo; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Shirai, Shigeru, 4,490,454, Cl. 430-84.000.
Osawa, Hideo: *See*—
Ishida, Tsuyoshi; Osawa, Hideo; and Naruse, Kazuaki, 4,490,846, Cl. 382-7.000.
Osborn, Norbert L. Turbocharger and adaptations thereof. 4,490,622, Cl. 290-52.000.
Oshima, Hiroyo; Kano, Isao; Kojima, Yutaka; Harada, Kazuo; and Konno, Takeo, to Jujo Paper Co., Ltd. Thermal dye-transfer type recording sheet. 4,490,434, Cl. 428-341.000.
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Ostrobrod, Meyer. Safety winch with disengageable drive. 4,489,919, Cl. 254-346.000.
Otis Engineering Corporation: *See*—
Canalizo, Carlos R.; and Fisher, Ernest P., Jr., 4,489,743, Cl. 137-155.000.
Raulins, George M.; Grimmer, George G.; and Peterson, James L., 4,489,963, Cl. 285-350.000.
Otsuka, Shigeru, to NEC Corporation. Repeater station for use in a radio relay system to protect time deviations of time slots. 4,490,818, Cl. 370-26.000.

Otters, John. Variable cycle stirling engine and gas leakage control system therefor. 4,489,554, Cl. 60-518.000.
Otteson, Kenneth M.: *See*—
Dawson, Daniel J.; and Otteson, Kenneth M., 4,490,557, Cl. 564-159.000.
Oude Alink, Bernardus A., to Petrolite Corporation. 2,5,6,8,9-Pentaalkyl or penta-aralkyl-substituted 1,3,7-triazabicyclo(3,3,1) non-3-enes and trialkyl or triaralkyl-substituted tetrahydropyrimidines. 4,490,293, Cl. 260-243.300.
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Poehlman, Arthur G., 4,489,699, Cl. 123-525.000.
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Lilja, Launo L.; and Makitalo, Valto J., 4,490,170, Cl. 75-26.000.
Over, William R.; Wion, Donald A.; and Heffner, Richard M., to AMP Incorporated. Modular lead maker. 4,489,476, Cl. 29-564.400.
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Ames, Geoffrey C., 4,489,847, Cl. 220-71.000.
Oxley, James E.: *See*—
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Ozaki, George T.; Benumof, Jonathan L.; and Andersen, Henrik W., to University of California, The Regents of the. Double lumen tube adaptor and valve system for medical anesthesia circuits. 4,489,721, Cl. 128-205.240.
Pacanowski, Ronald F.; Sampson, Robert W.; and Kuchar, Paul J., to UOP Inc. Density monitor and method. 4,489,592, Cl. 73-30.000.
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Bosche, Horst G.; Nohe, Heinz; and Pachaly, Heinz, 4,490,214, Cl. 203-6.000.
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Page, Paul F., to Cooper Industries, Inc. Electric switch with cleaning action. 4,490,591, Cl. 200-68.200.
Pagnucco, Gilbert: *See*—
Tombal, Gerard; and Pagnucco, Gilbert, 4,489,835, Cl. 211-41.000.
Palmer, Nicholas J.; and Pocock, Anthony R. H., to British Steel Corporation. Production of tubular members. 4,489,585, Cl. 72-387.000.
PanAb: *See*—
Brunhouse, Robert F., 4,490,473, Cl. 436-518.000.
Panaretto, Basil A.; Moore, Geoffrey P. M.; and Robertson, Duncan M., to Commonwealth Scientifique & Industrial Research Organization. Defleecing compounds. 4,490,365, Cl. 424-177.000.
PanCanadian Petroleum Limited: *See*—
Stipdonk, Gustaaf, 4,489,828, Cl. 198-847.000.
Panduit Corp.: *See*—
Kirsinas, Peter; Brouwer, John J.; Purpura, Richard M.; and Wiencek, Donald C., 4,489,589, Cl. 72-424.000.
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Pantone, Richard S.: *See*—
Allen, Gary F.; and Pantone, Richard S., 4,490,300, Cl. 260-453.0SP.
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Konzal, Daryl R.; Johnson, Craig N.; and Baumgartner, Donald W., 4,490,130, Cl. 493-106.000.
Papineau, Patrick F.: *See*—
Sines, Roger B.; Field, Thomas T.; and Papineau, Patrick F., 4,490,186, Cl. 148-11.50N.
Paris, Michel: *See*—
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Park, Hyo-Sup. Dynamic vehicle tire and wheel balancing system. 4,489,607, Cl. 73-462.000.
Parker, Loyd C., to United States of America, National Aeronautics and Space Administration. Inflight IFR procedures simulator. 4,490,117, Cl. 434-35.000.
Parma Corporation: *See*—
Miller, John E., 4,489,450, Cl. 5-250.000.
Pascher, Helmut, to Siemens Aktiengesellschaft. Closure system for a split sleeve consisting of shrinkable material. 4,490,422, Cl. 428-36.000.
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Doria, Gianfederico; Passarotti, Carlo; and Arcari, Giuliana, 4,490,376, Cl. 424-251.000.
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Stauffer, Randall C.; and Pasztor, Andrew J., 4,490,262, Cl. 252-8.55R.
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Bunk, Axel; and Stadler, Karl, 4,490,646, Cl. 313-579.000.
Dobrusskin, Alexander; and Marsen, Georg, 4,490,642, Cl. 313-25.000.
Patton, John T., Jr.; Narayan, Thirumurti; and Dumas, Louis H., to BASF Wyandotte Corporation. High load bearing flexible polyurethane foams. 4,490,490, Cl. 521-177.000.
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Steinberger, Josef, 4,489,619, Cl. 73-862.650.
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Pearce, Ronald E. Tillage and planter carrier. 4,489,789, Cl. 172-443.000.
Pearson, Arthur C., to ACF Industries, Incorporated. Hand brake arrangement. 4,489,814, Cl. 188-33.000.
Pease, Logan L.; and Carmean, Wes F., to IGT. Pinhole objective fibre optic light pen. 4,490,607, Cl. 250-227.000.
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Peikert, Juergen, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. System for controlling the thrust nozzle adjustment of dual cycle gas turbine jet propulsion engines. 4,489,550, Cl. 60-204.000.
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Chang, Clarence D.; and Pelrine, Bruce P., 4,490,565, Cl. 568-798.000.
Chang, Clarence D.; and Pelrine, Bruce P., 4,490,566, Cl. 568-798.000.
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Pendery, John J., to Ethyl Corporation. Mixed solvent recovery of 4,4'-dihydroxybiphenyl. 4,490,564, Cl. 568-730.000.
Penke, Botond: *See*—
Rivier, Jean E. F.; and Penke, Botond, 4,490,364, Cl. 424-177.000.
Pennwalt Corporation: *See*—
Hiebert, Jacob F., 4,489,822, Cl. 198-478.000.
Penzel, Herbert W.: *See*—
Bolante, Jay J.; and Penzel, Herbert W., 4,490,576, Cl. 174-65.0SS.
Perfectdata Corporation: *See*—
Neuman, Eli; and Davis, C. Paul, 4,490,767, Cl. 360-137.000.
Perfecto Industries, Inc.: *See*—
Bolton, David R.; Koverman, Charles A.; and Neargarder, Marvin L., 4,489,872, Cl. 226-117.000.
Perkins, Thomas K., to Atlantic Richfield Company. Viscous oil production using electrical current heating and lateral drain holes. 4,489,782, Cl. 166-248.000.
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Persson, John A., to Lectromelt Corporation. Method for reducing ore. 4,490,169, Cl. 75-11.000.
Persson, John A., to Lectromelt Corporation. Water-cooled electrode. 4,490,825, Cl. 373-96.000.
Peter, Cornelius: *See*—
Burkel, Rainer; and Peter, Cornelius, 4,489,690, Cl. 123-419.000.
Petersen, Corey: *See*—
Barlow, Allen R.; and Petersen, Corey, 4,490,629, Cl. 307-451.000.
Petersen, Luis, to F. L. Smidth & Co. A/S. Vertical roller mills. 4,489,895, Cl. 241-19.000.
Peterson, Bruce W.; Speranza, George P.; and Grigsby, Robert A., Jr., to Texaco Inc. Manufacture of flexible polyurethane foam containing a condensation product of polyethylene terephthalate. 4,490,485, Cl. 521-48.000.
Peterson, James L.: *See*—
Raulins, George M.; Grimmer, George G.; and Peterson, James L., 4,489,963, Cl. 285-350.000.
Peterson, John R., to Exxon Research and Engineering Co. Insulation of domed reactor vessels. 4,490,334, Cl. 422-241.000.
Petro-Canada Exploration Inc.: *See*—
Stipdonk, Gustaaf, 4,489,828, Cl. 198-847.000.
Petrofina Canada Inc.: *See*—
Stipdonk, Gustaaf, 4,489,828, Cl. 198-847.000.
Petrolite Corporation: *See*—
Oude Alink, Bernardus A., 4,490,293, Cl. 260-243.300.
Petty, John D. Method and means for electrode calibration. 4,490,236, Cl. 204-409.000.
Petzi, Fritz, to Ludwig Riedhammer GmbH & Co. KG. Process for reducing the oxygen content of the atmosphere in a heat treatment furnace and heat treatment furnace for carrying out this process. 4,490,108, Cl. 432-23.000.
Philipson, Joseph: *See*—
Corboy, Thomas A.; and Philipson, Joseph, 4,490,282, Cl. 252-503.000.
Phillimore, Horace R. Overload protection of loudspeakers. 4,490,770, Cl. 361-94.000.
Phillips Petroleum Company: *See*—
Banks, Robert L.; and Kukes, Simon G., 4,490,478, Cl. 502-254.000.
Bertus, Brent J.; and McKay, Dwight L., 4,490,299, Cl. 260-429.00R.
Cheng, Paul J., 4,490,346, Cl. 423-456.000.
Drake, Charles A., 4,490,567, Cl. 585-324.000.
Shropshire, Robin D., 4,490,494, Cl. 524-87.000.
Stapp, Paul R.; and Chaney, Mary B., 4,490,263, Cl. 252-8.55D.
Van Pool, Joe; and Hann, Paul D., 4,490,563, Cl. 568-697.000.
Van Pool, Joe; and Hann, Paul D., 4,490,572, Cl. 585-800.000.
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Dauben, William G.; Jeffries, Phillip R.; and Phillips, Richard B., 4,490,226, Cl. 204-159.000.
Piccolini, Richard J.; and Smith, Michael J., to Rohm and Haas Company. Catalyst for the preparation of α,β-unsaturated compounds. 4,490,476, Cl. 502-203.000.
Piccolo, Dominic J.: *See*—
Cherukuri, S. Rao; Bilka, Kenneth P.; Hriscisce, Frank; and Piccolo, Dominic J., 4,490,395, Cl. 426-3.000.

Pieper, Helmut: *See—*
Reiffen, Manfred; Heider, Joachim; Hauel, Norbert; Austel, Volkhard; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Noll, Klaus; Pieper, Helmut; Kruger, Gerd; and Keck, Johannes, 4,490,369, Cl. 424-244.000.

Pierce, John M.; and Lehrer, William L., to Fairchild Camera & Instrument Corp. Smooth glass insulating film over interconnects on an integrated circuit. 4,490,737, Cl. 357-73.03J.

Pierce, John M.: *See—*
Keyser, Thomas; Thomas, Michael E.; Pierce, John M.; and Cleeves, James M., 4,489,482, Cl. 29-591.000.

Pierce, June S.: *See—*
Pierce, Larry L.; and Pierce, June S., 4,490,147, Cl. 604-378.000.

Pierce, Larry L.; and Pierce, June S. Absorbent sanitary napkin. 4,490,147, Cl. 604-378.000.

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Moinsonnier, Gerard, 4,489,717, Cl. 128-80.00F.

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Malafosse, Jean; Varlot, Gerard; and Pierre, Michel, 4,490,272, Cl. 252-181.300.

Pieters, Wim J.M.; and Gates, William E., to Omicron Technology Corporation. Method and apparatus for determining the amount of gas adsorbed or desorbed from a solid. 4,489,593, Cl. 73-38.000.

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Albrecht, Robert J.; Ignatuk, Daniel; Pinto, Albert A.; and Simelunas, William J., 4,489,632, Cl. 83-404.200.

Pioneer Electronic Corporation: *See—*
Nishioka, Akira; and Hirata, Hitoshi, 4,490,838, Cl. 381-15.000.

Pisecky, Jan; Krag, Jens; and Sorensen, Ib H., to A/S Niro Atomizer. Process for producing an agglomerated powdery milk product. 4,490,403, Cl. 426-453.000.

Pisiotas, Georg; and Rohr, Otto, to Ciba-Geigy Corporation. Oxime derivatives of diphenyl ethers and their use in herbicidal compositions. 4,490,167, Cl. 71-105.000.

Pitney Bowes Inc.: *See—*
De Luca, Albert M.; and Buan, Danilo P., 4,489,651, Cl. 101-93.360.

Plaskura, Andrzej; Lachman, Ignacy; Byrka, Tadeusz; Leszczynski, Zbigniew; Rogalski, Krzysztof; Koch, Marta; and Zyczynski, Jozef, to Biuro Projektow i Realizacji Inwestycji Przemyslu Syntezy Chemicznej "Prosynchem" . Process for contacting gas and liquid as well as packing for the application of this process. 4,490,310, Cl. 261-79.00A.

Plastican, Inc.: *See—*
Blanchette, Henry J., 4,489,849, Cl. 220-91.000.

Plattner, Jacob J.; and Fung, Anthony K., to Abbott Laboratories. Benzisoxazole carboxylic acids. 4,490,384, Cl. 424-272.000.

Plourde, Richard G.: *See—*
Bose, Amar G.; and Plourde, Richard G., 4,490,843, Cl. 381-102.000.

Poag, D. W.; and Merritt, W. R., to Canadian Patents & Development Limited. Light weight vault door. 4,489,663, Cl. 109-76.000.

Pocock, Anthony R. H.: *See—*
Palmer, Nicholas J.; and Pocock, Anthony R. H., 4,489,585, Cl. 72-387.000.

Podos, Steven; Serle, Janet B.; and Mittag, Thomas. Method of reducing intraocular pressure and treating glaucoma using corynanthine. 4,490,379, Cl. 424-262.000.

Poehlman, Arthur G., to Outboard Marine Corporation. Control mechanism for selectively operating an internal combustion engine on two fuels. 4,489,699, Cl. 123-525.000.

Pogson, Jack: *See—*
Barresi, Anthony J.; Nelson, Leonard; and Pogson, Jack, 4,489,923, Cl. 269-8.000.

Pohlhausen, Henn. Equipment for the raising of eels, crayfish and other bottom-living marine organisms. 4,489,673, Cl. 119-2.000.

Polaroid Corporation: *See—*
Choinski, Edward J., 4,489,671, Cl. 118-412.000.
Kisler, Semyon, 4,489,672, Cl. 118-620.000.
Shenk, Edwin K., 4,490,814, Cl. 367-140.000.

Poldervaart, Leendert: *See—*
Coppens, Anton; and Poldervaart, Leendert, 4,490,121, Cl. 441-5.000.

Polster, Rudolf: *See—*
Fechner, Wolf D.; Kranz, Joachim; and Polster, Rudolf, 4,490,176, Cl. 106-23.000.

Polydex Chemicals Ltd.: *See—*
Tosoni, Anthony L., 4,490,470, Cl. 435-211.000.

Polymer Processing Research Institute Ltd.: *See—*
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,489,630, Cl. 83-15.000.

Pompei Katz de Warrens, Jean, to Jaeger. Multicomponent electrolyte with a definite potential and a display cell containing it. 4,490,024, Cl. 350-363.000.

Porkhun, Fedor K.: *See—*
Kuchuk-Yatsenko, Sergei I.; Krivenko, Valery G.; Bogorsky, Mikhail V.; Lazebny, Ivan L.; Porkhun, Fedor K.; Sakharnov, Vasily A.; and Cherednichok, Vitaly T., 4,490,081, Cl. 409-300.000.

Porter, Philip: *See—*
Gani, Mohamed M.; May, Keith; and Porter, Philip, 4,490,290, Cl. 260-112.00B.

Poston, Billy R.; and Atkinson, Stuart L., to E Systems, Inc. Digital pulse detector circuit having selectable false alarm rate. 4,490,831, Cl. 375-94.000.

Poulo, Louis, to Analogic Corporation. Instrumentation amplifier having automatic offset adjustment. 4,490,682, Cl. 330-9.000.

Powers Manufacturing, Inc.: *See—*
Powers, Whitney S., 4,490,800, Cl. 364-558.000.

Powers, Whitney S., to Powers Manufacturing, Inc. Dual head gauger apparatus with automatic adjustment for pressure variation. 4,490,800, Cl. 364-558.000.

PPG Industries, Inc.: *See—*
Prange, Bernard H.; and Helenschmidt, Dale J., 4,489,870, Cl. 225-2.000.

Prange, Bernard H.; and Helenschmidt, Dale J., to PPG Industries, Inc. Apparatus for severing edges of a glass sheet. 4,489,870, Cl. 225-2.000.

Prazak, Paul R.: *See—*
Mrozowski, Andrij; and Prazak, Paul R., 4,490,713, Cl. 340-347.0AD.

Prazisions-Technik GmbH: *See—*
Henseleit, Roland; and Kolb, Carl-Joachim, 4,489,522, Cl. 51-165.710.

Precise Flight, Inc.: *See—*
Ziegelmeyer, Harold R., 4,489,907, Cl. 244-203.000.

Precision Industries, Inc.: *See—*
Kezran, Mitchell, 4,490,080, Cl. 408-68.000.

Premont, Emile J., to United Technologies Corporation. Containment structure. 4,490,092, Cl. 415-1.000.

President and Fellows of Harvard College: *See—*
Greene, Mark I.; and Fields, Bernard N., 4,490,358, Cl. 424-86.000.

Pribis, Milan. Elongated panoramic mirror deflector. 4,490,013, Cl. 350-632.000.

Priddy, Jerry L. Digital fluid flow meter. 4,489,616, Cl. 73-861.790.

Priester, Thomas M.; and Rayner, Dennis R., to Du Pont de Nemours, E. I., and Company. Synergistic compositions of carbamate insecticides. 4,490,390, Cl. 424-298.000.

Prikhodko, Valery V.; Kostyrkin, Boris V.; and Tsarenko, Pavel I., to Proektno-Konstruktorskoe Bjuro Elektrogidravliki Akademii Nauk Ukrainskoi SSR. Method for electrohydroblasting of castings. 4,490,180, Cl. 134-1.000.

Pritchitt, Frederick J., to Marpac Industries, Inc. Dispensing valve to be used with bottles of fluent imaging material for the development of electrostatic images. 4,489,858, Cl. 222-182.000.

Probe Adventures, Inc.: *See—*
Underwood, Mark R., 4,489,733, Cl. 130-24.000.

Procter & Gamble Company, The: *See—*
Kebanli, Ertugrul S., 4,490,285, Cl. 252-551.000.
Spadini, Gianfranco L.; Larrabee, Antoinette L.; and Liu, Don K. K., 4,490,271, Cl. 252-174.230.
Spendel, Wolfgang U., 4,489,574, Cl. 68-16.000.

Proctor & Gamble Company, The: *See—*
Spendel, Wolfgang U., 4,489,455, Cl. 8-158.000.

Prodeco, Inc.: *See—*
Worthington, Ralph E.; and Magdics, Alex, 4,490,336, Cl. 423-10.000.

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Prikhodko, Valery V.; Kostyrkin, Boris V.; and Tsarenko, Pavel I., 4,490,180, Cl. 134-1.000.

Prohaska, Hans: *See—*
Andrei-Alexandru, Marcel; and Prohaska, Hans, 4,489,599, Cl. 73-146.500.

Protective Treatments, Inc.: *See—*
Gerace, Michael J., 4,490,424, Cl. 428-68.000.

PTC Aerospace Inc.: *See—*
Brennan, Edward J., 4,489,978, Cl. 297-232.000.

Pullukat, Thomas: *See—*
Hoff, Raymond E.; and Pullukat, Thomas, 4,490,514, Cl. 526-165.000.

Purdue Research Foundation: *See—*
Gong, Cheng Shung; Chen, Li Fu; Flickinger, Michael C.; and Tsao, George T., 4,490,468, Cl. 435-161.000.
Wolters, William R.; Chrisman, Charles L.; and Libey, George S., 4,489,674, Cl. 119-3.000.

Purex Corporation: *See—*
Hackett, Walter J.; and Ito, Kyle K., 4,490,270, Cl. 252-106.000.

Purpura, Richard M.: *See—*
Kirsinas, Peter; Brouwer, John J.; Purpura, Richard M.; and Wiencek, Donald C., 4,489,589, Cl. 72-424.000.

Putnam, Norman A.: *See—*
Brown, Ernest C.; Buske, Walter E.; and Putnam, Norman A., 4,489,506, Cl. 34-57.00A.

Pyromid, Inc.: *See—*
Hait, Paul W., 4,489,706, Cl. 126-9.00R.

Quaker Plastic Corporation: *See—*
Dahowski, Donald E., 4,490,067, Cl. 404-4.000.

Quan, Wing C., to Westinghouse Electric Corp. Universal programmable interface. 4,490,775, Cl. 361-406.000.

Quantel S.A.: *See—*
Moya, Francois, 4,490,021, Cl. 350-162.230.

Quantitative Environmental Decisions Corporation: *See—*
Dickinson, William D.; Mioduszewski, David; and Bernardin, Frederick E., Jr., 4,489,779, Cl. 166-64.000.

Quantum Corporation: *See—*
Harrison, Joel N.; Daniels, Donald V.; and Brown, David A., 4,490,635, Cl. 310-38.000.

Quinn, David G.; and Edwards, Robert B., II, to Viridian, Inc. Feeding tube assembly. 4,490,143, Cl. 604-270.000.

Quintana, Manuel E.; and Estabrook, Lawrence E., to Texaco Development Corporation. Apparatus for recovery of water from dispersions of soot and water. 4,490,251, Cl. 210-209.000.

Radiographic Screen Oy: *See*—
Riihimaki, Esko; and Korhola, Ossi, 4,490,615, Cl. 250-487.100.
Rae, Malcolm C., to Redland Roof Tiles Limited. Wire electrode spark erosion. 4,490,600, Cl. 219-69.00W.
Ramsay, Glynn R.; and Salmon, Dennis J., to Gould Inc. Prevention of overpressurization of lithium-thionyl chloride battery cells. 4,490,446, Cl. 429-57.000.
Ransburg-Gema AG: *See*—
Buschor, Karl; Giesinger, Hans; and Moos, Kurt, 4,489,749, Cl. 137-487.500.
Rao, B. Rama; and Robbins, Kenneth W., to Sperry Corporation. Apparatus and method of measuring the level of a liquid. 4,489,601, Cl. 73-290.00R.
Rapp, Egon: *See*—
Flaig, Hans; Rapp, Egon; Brede, Herrmann; and Ganter, Wolfgang, 4,490,051, Cl. 368-109.000.
Rask, Rodney B.: *See*—
Klomp, Edward D.; and Rask, Rodney B., 4,489,595, Cl. 73-115.000.
Rasmussen, Marvin W., to Schlumberger Technology Corporation. Well-logging data processing system having segmented serial processor-to-peripheral data links. 4,490,788, Cl. 364-200.000.
Rattan, William D.; and Walwyn, Craig M., to General Signal Corporation. Disc cleaning machine. 4,489,740, Cl. 134-140.000.
Rauland-Borg Corporation: *See*—
Singhi, Dilip T., 4,490,050, Cl. 368-46.000.
Raulins, George M.; Grimmer, George G.; and Peterson, James L., to Otis Engineering Corporation. Pipe joint. 4,489,963, Cl. 285-350.000.
Rauschelbach, Paul A.: *See*—
Griffith, Carl D.; Rauschelbach, Paul A.; Robinson, Robert W.; and Skutecki, Edmund R., 4,490,794, Cl. 364-433.000.
Rauth, Gerhard: *See*—
Skudelny, Dieter; and Rauth, Gerhard, 4,490,492, Cl. 523-443.000.
Raymond Kaiser Engineers Inc.: *See*—
Gidick, Ward F., 4,489,747, Cl. 137-315.000.
Rayner, Dennis R.: *See*—
Priester, Thomas M.; and Rayner, Dennis R., 4,490,390, Cl. 424-298.000.
Raytheon Company: *See*—
Hardie, George S.; Hernandez, Raphael; and Maybell, Michael J., 4,490,723, Cl. 343-754.000.
RCA Corporation: *See*—
Barresi, Anthony J.; Nelson, Leonard; and Pogson, Jack, 4,489,923, Cl. 269-8.000.
Behrend, William L., 4,490,693, Cl. 333-28.00R.
Levine, Peter A., 4,490,744, Cl. 358-213.000.
Silver, Robert S., 4,490,643, Cl. 313-391.000.
Sterzer, Fred, 4,490,668, Cl. 322-2.00R.
Read, Clifford D.; Dolan, Bruce I.; and McDonald, Paul D., to Northern Telecom Limited. Input/output device arrangements for terminals. 4,490,604, Cl. 235-146.000.
Reber, William L. High technology jewelry and fabrication of same. 4,490,440, Cl. 428-620.000.
Rebish, Edward J., to Russell, Burdsall, & Ward Corporation. Sealing capped nut and bolt therefor. 4,490,083, Cl. 411-338.000.
Reddix, Lloyd E.: *See*—
Huizenga, John R.; and Reddix, Lloyd E., 4,490,139, Cl. 604-57.000.
Redemann, Carl T., to Dow Chemical Company, The. Halopyridine sulfonamide as insecticidal agents. 4,490,380, Cl. 424-263.000.
Redland Roof Tiles Limited: *See*—
Rae, Malcolm C., 4,490,600, Cl. 219-69.00W.
Reece, John B. Method and construction of unitary welt and flap for a pocket opening. 4,489,445, Cl. 2-247.000.
Reece, John W., to NCR Corporation. Print wire solenoid. 4,490,057, Cl. 400-124.000.
Reed, Charles C. Heart valve prosthesis. 4,489,446, Cl. 3-1.500.
Regie Nationale des Usines Renault: *See*—
Avian, Philippe; and Lepretre, Bernard, 4,489,689, Cl. 123-417.000.
Reich, Egon: *See*—
Reich, Egon, II, 4,489,770, Cl. 150-52.00R.
Reich, Egon, II, to Reich, Egon. Waterproof enclosure. 4,489,770, Cl. 150-52.00R.
Reid, David S.: *See*—
Cooper, John; Reid, David S.; Mumme-Young, Colin A.; and Gregson, Robert D., 4,490,195, Cl. 149-2.000.
Reiff, Helmut F.: *See*—
Pantone, Richard S.; and Reiff, Helmut F., 4,490,301, Cl. 260-453.0SP.
Reiffen, Manfred; Heider, Joachim; Hauel, Norbert; Austel, Volkhard; Eberlein, Wolfgang; Kobinger, Walter; Lillie, Christian; Noll, Klaus; Pieper, Helmut; Kruger, Gerd; and Keck, Johannes, to Dr. Karl Thomae Gesellschaft mit beschrankter Haftung. Benzazepine derivatives, their pharmaceutical compositions and method of use. 4,490,369, Cl. 424-244.000.
Reiner, Jack L. Multiplex sign indicia. 4,489,513, Cl. 40-447.000.
Relle nee Somfa, Zsuzsanna: *See*—
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Honty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos, 4,490,378, Cl. 424-262.000.
Reneau, Inc.: *See*—
Reneau, Raymond P., 4,489,850, Cl. 220-323.000.
Reneau, Raymond P., to Reneau, Inc. Closure member for pressure vessel. 4,489,850, Cl. 220-323.000.
Rennard, Raymond J.: *See*—
Vogel, Roger F.; Rennard, Raymond J.; and Tabacek, Joseph A., 4,490,479, Cl. 502-309.000.
Vogel, Roger F.; Rennard, Raymond J.; and Tabacek, Joseph A., 4,490,483, Cl. 502-309.000.
Research Corporation: *See*—
Enke, Christie G.; Newcome, Bruce H.; and Holland, John F., 4,490,806, Cl. 364-734.000.
Rexnord Inc.: *See*—
Anderson, William B., 4,489,827, Cl. 198-844.000.
Reyes, Jaime M.: *See*—
Moore, Diane E.; Reyes, Jaime M.; and Munteanu, Eugen, 4,489,742, Cl. 136-203.000.
Reynolds, Alvin E. Apparatus for corneal corrective techniques. 4,490,022, Cl. 351-211.000.
Reynolds, Blake: *See*—
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,490,156, Cl. 48-61.000.
Rhee, Dennis W., to Ford Motor Company. Electronic control switch for a power boost amplifier. 4,490,683, Cl. 330-51.000.
Rheinmetall GmbH: *See*—
Winkler, Gert; Becker, Wilfried; Zielinski, Erich; and Lipp, Herbert, 4,489,639, Cl. 89-46.000.
Rhoades, James J., to Tapco Products Company, Inc. Portable sheet bending brake. 4,489,583, Cl. 72-319.000.
Rhone-Poulenc Fibres: *See*—
Buzano, Michel; and Danancier, Joanny, 4,489,542, Cl. 57-206.000.
Richardson, Hugh W., to Kocide Chemical Corporation. Preparation of cupric hydroxide. 4,490,337, Cl. 423-43.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Honty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos, 4,490,378, Cl. 424-262.000.
Richter, George N.: *See*—
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,490,156, Cl. 48-61.000.
Ricketts, Thomas E., to Occidental Oil Shale, Inc. Blasthole spacing for control of particle size. 4,489,983, Cl. 299-2.000.
Ricoh Company, Ltd.: *See*—
Shinohara, Hiroichi, 4,490,019, Cl. 350-464.000.
Riddle, Stanley T.: *See*—
Conly, Douglas J.; Baker, Bonnie B.; Larson, David D.; and Riddle, Stanley T., 4,490,032, Cl. 355-14.00R.
Rieck, James N.: *See*—
Ma, Eric C.; and Rieck, James N., 4,490,302, Cl. 260-453.0AM.
Riemer, Fritz, to Carl-Zeiss-Stiftung, d/b/a Carl Zeiss. Device for applying radiation at adjustable angles. 4,490,041, Cl. 356-334.000.
Riessberger, Klaus: *See*—
Theurer, Jose; and Riessberger, Klaus, 4,490,038, Cl. 356-5.000.
Riihimaki, Esko; and Korhola, Ossi, to Radiographic Screen Oy. X-ray intensifying screen. 4,490,615, Cl. 250-487.100.
Riley, Jack. Ladder-mountable device. 4,489,911, Cl. 248-238.000.
Rinkewich, Isaac. Irrigation system. 4,489,888, Cl. 239-183.000.
Rion Kabushiki Kaisha: *See*—
Tanaka, Katsumi, 4,490,585, Cl. 179-107.0FD.
Risacher, Gerard H.: *See*—
Snider, Harold F.; and Risacher, Gerard H., 4,490,704, Cl. 337-372.000.
Risi, Angelo; and Risi, Antonio. Retaining wall system. 4,490,075, Cl. 405-273.000.
Risi, Antonio: *See*—
Risi, Angelo; and Risi, Antonio, 4,490,075, Cl. 405-273.000.
Risner, Joseph. Ignition coil testing means. 4,490,677, Cl. 324-388.000.
Ritsko, Joseph E.; and Acla, Howard L., to GTE Products Corporation. Process for the recovery of high purity tantalum oxide. 4,490,340, Cl. 423-65.000.
Rivier, Jean E. F.; and Penke, Botond, to Salk Institute for Biological Studies, The. CCK Agonists II. 4,490,364, Cl. 424-177.000.
Robbins, Jerry L. Method and apparatus for providing a sealed trailer wheel. 4,489,988, Cl. 301-108.00S.
Robbins, Kenneth W.: *See*—
Rao, B. Rama; and Robbins, Kenneth W., 4,489,601, Cl. 73-290.00R.
Robert Bosch GmbH: *See*—
Bura, Ernst, 4,489,487, Cl. 29-840.000.
Burkel, Rainer; and Peter, Cornelius, 4,489,690, Cl. 123-419.000.
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,489,698, Cl. 123-502.000.
Leiber, Heinz, 4,489,555, Cl. 60-534.000.
Linder, Ernst; Maurer, Helmut; and Muller, Klaus, 4,489,596, Cl. 73-116.000.
Simon, Nikolaus, 4,489,701, Cl. 123-531.000.
van der Weide, Jouke, 4,489,700, Cl. 123-527.000.
Roberts, Michael M.: *See*—
Dean, Raymond H.; and Roberts, Michael M., 4,489,881, Cl. 236-49.000.
Roberts, Stanley: *See*—
Ishaq, Mousa H.; Roberts, Stanley; and Ryan, James G., 4,490,193, Cl. 148-188.000.
Robertshaw Controls Company: *See*—
Crowson, James A., 4,489,483, Cl. 29-602.00R.

Robertson, Duncan M.: *See*—
Panaretto, Basil A.; Moore, Geoffrey P. M.; and Robertson, Duncan M., 4,490,365, Cl. 424-177.000.

Robinson, David A.: *See*—
Shields, Steven E.; and Robinson, David A., 4,489,479, Cl. 29-575.000.

Robinson, Earl F., to C. R. Bard, Inc. Electrical connector. 4,490,003, Cl. 339-75.0MP.

Robinson, Robert W.: *See*—
Griffith, Carl D.; Rauschelbach, Paul A.; Robinson, Robert W.; and Skutecki, Edmund R., 4,490,794, Cl. 364-433.000.

Roca-Nierga, Manuel, to SPICA S.p.A. Modular fuel injection pumps for internal combustion engines. 4,489,694, Cl. 123-449.000.

Rockwell International: *See*—
Schorr, Ian A., 4,490,692, Cl. 333-28.00R.

Rockwell International Corporation: *See*—
Bampton, Clifford C., 4,490,188, Cl. 148-12.70A.
Lemon, Robert W., 4,489,626, Cl. 74-781.00R.

Rockwool Aktiebolaget: *See*—
Kumbrant, Lars; Olofsson, Gunnar; and Larsson, Mats, 4,489,604, Cl. 73-432.00R.

Rodgers, Larry C., to Honeywell Inc. Variable time constant anticipation thermostat. 4,489,882, Cl. 236-78.00D.

Rodriquez, Ernest A. Contractible escape ladder. 4,489,807, Cl. 182-96.000.

Roesl, Wolfgang: *See*—
Guenther, Horst H.; and Roesl, Wolfgang, 4,490,588, Cl. 200-11.00R.

Rogalski, Krzysztof: *See*—
Plaskura, Andrzej; Lachman, Ignacy; Byrka, Tadeusz; Leszczynski, Zbigniew; Rogalski, Krzysztof; Koch, Marta; and Zyczynski, Jozef, 4,490,310, Cl. 261-79.00A.

Rohm Company Limited: *See*—
Tatsumi, Yutaka; and Taniguchi, Hideo, 4,489,485, Cl. 29-620.000.

Rohm and Haas Company: *See*—
Piccolini, Richard J.; and Smith, Michael J., 4,490,476, Cl. 502-203.000.

Rohr, Otto: *See*—
Pissiotas, Georg; and Rohr, Otto, 4,490,167, Cl. 71-105.000.

Rollenitz, Leopold: *See*—
Freudenschuss, Otto; Morell, Josef; Rollenitz, Leopold; and Schmidt, Harald, 4,490,098, Cl. 417-499.000.

Romer, Michael: *See*—
Eidenschink, Rudolf; Romer, Michael; and Weber, Georg, 4,490,305, Cl. 260-465.00F.

Rood, Leonard M.: *See*—
Findlay, Hugh T.; and Rood, Leonard M., 4,490,430, Cl. 428-217.000.

Rose, Frederick: *See*—
Del Bagno, Anthony C.; Giordano, Richard R.; and Rose, Frederick, 4,489,777, Cl. 165-104.260.

Rosowsky, Andre, to Dana-Farber Cancer Institute, Inc. Cysteic acid and homocysteic acid analogues of methotrexate and aminopterin. 4,490,529, Cl. 544-260.000.

Rossi & Catelli S.p.A.: *See*—
Catelli, Camillo, 4,489,769, Cl. 141-91.000.

Rossier, Marcel: *See*—
Acklin, Leo; and Rossier, Marcel, 4,490,030, Cl. 354-322.000.

Roth, Sydney J.: *See*—
Marino, Joseph A.; Kling, Michael J.; Roth, Sydney J.; and Makhija, Surender K., 4,490,799, Cl. 364-551.000.

Rounion, William A.; and Modlin, Phillip R., to Teledyne Industries, Inc. Radio navigation system. 4,490,722, Cl. 343-394.000.

Roush, David H., deceased: *See*—
Long, Barry W.; and Roush, David H., deceased, 4,489,760, Cl. 139-11.000.

Roush, Vivian J., heir: *See*—
Long, Barry W.; and Roush, David H., deceased, 4,489,760, Cl. 139-11.000.

Roussel Uclaf: *See*—
Barton, Derek H. R.; Motherwell, William B.; and Zard, Samir Z., 4,490,296, Cl. 260-397.400.

Royal Diversified Products: *See*—
Ellin, Roger E., 4,489,443, Cl. 2-153.000.

Royston Manufacturing Corporation: *See*—
Norton, Terry L.; and Constantine, Neil V., 4,489,996, Cl. 312-279.000.

Rubin, David: *See*—
Rubin, Ely J.; and Shahak, Israel, 4,490,523, Cl. 536-4.100.

Rubin, Ely J.; and Shahak, Israel, to Rubin, Ely J.; Rubin, David; and Century Science Corp. Mandelonitrile triacetyl glucuronate and process for preparing same. 4,490,523, Cl. 536-4.100.

Ruch, Jean; and Katrynick, Detlef, to Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG. Battery having electrolyte supply reservoir and activation tank disposed in a battery housing. 4,490,443, Cl. 429-27.000.

Rumble, Ray M., to Michigan Hanger Company. Pipe hanger. 4,489,908, Cl. 248-62.000.

Russ, Norman. Container cover lock. 4,489,851, Cl. 220-323.000.

Russ, William A.: *See*—
Gary, David A., 4,489,787, Cl. 172-1.000.

Russell, Burdsall, & Ward Corporation: *See*—
Rebish, Edward J., 4,490,083, Cl. 411-338.000.

Rutgerswerke AG: *See*—
Knips, Ulrich, 4,490,552, Cl. 560-130.000.

Ruth, Roy L., to Ball Corporation. Multipole magnet for electron beam correction. 4,490,703, Cl. 335-212.000.

Ryan, Douglas G.: *See*—
Comeaux, Roy V.; Leighton, Milton D.; and Ryan, Douglas G., 4,490,240, Cl. 208-47.000.

Ryan, James G.: *See*—
Ishaq, Mousa H.; Roberts, Stanley; and Ryan, James G., 4,490,193, Cl. 148-188.000.

Ryan, John F.; and Wright, John G., to Northern Telecom Limited. Elevating jig for semi-conductor wafers and similar articles. 4,490,087, Cl. 414-417.000.

Rypkema, Jouke N.: *See*—
Mycynek, Victor; and Rypkema, Jouke N., 4,490,743, Cl. 358-197.000.

Ryzhikov, Engels N.: *See*—
Volynets, Filipp K.; Demidenko, Vladimir A.; Denisov, Roman A.; Denx, Viktor P.; Dydelzak, Alexandr E.; Ryzhikov, Engels N.; and Terentieva, Evgenia A., 4,490,286, Cl. 252-583.000.

S&C Electric Company: *See*—
Beebe, Emmett R.; Dizon, Edmund S.; and Kalvaitis, Arvydas J., 4,489,966, Cl. 292-334.000.
O'Leary, Raymond P., 4,490,707, Cl. 337-6.000.

S.E.C.A. Societe Anonyme, Societe d'Entreprises Commerciales et Aeronautiques: *See*—
Kenny, James E., 4,489,682, Cl. 123-58.00B.

S.N.E.C.M.A.: *See*—
Daime, Jean P.; and Lecler, Martial H., 4,489,579, Cl. 72-38.000.

Sadko, Vladimir I.: *See*—
Davidovich, Alexandr N.; Schukin, Valery Y.; Klushin, Valery A.; Sadko, Vladimir I.; Skrebets, Nikolai M.; and Murashko, Evgeny T., 4,489,581, Cl. 72-70.000.

Sagalovsky, Evgeny S.: *See*—
Maslyaev, Viktor S.; Sagalovsky, Evgeny S.; Khudosovtseva, Galina P.; Gorovets, Petr M.; Filimonova, Ljudmila Y.; and Zborschik, Ljubov A., 4,490,274, Cl. 252-186.220.

Sagane, Toshihiro: *See*—
Nagano, Riichiro; and Sagane, Toshihiro, 4,490,508, Cl. 525-316.000.

Sahni, Ram N., to NCR Corporation. Image capturing apparatus. 4,490,852, Cl. 382-48.000.

St. Clair, Albert R., to Simmons U.S.A. Corporation. Apparatus for transporting frames. 4,490,090, Cl. 414-567.000.

Saito, Akeomi: *See*—
Imamura, Kazuyoshi; Yasui, Koichi; and Saito, Akeomi, 4,490,415, Cl. 427-358.000.

Saito, Junji: *See*—
Oguri, Yasuo; Awata, Mitsuru; Saito, Junji; Inoue, Soichi; and Ariyama, Noriyuki, 4,490,320, Cl. 264-82.000.

Saito, Kazuo: *See*—
Shimada, Katsuhiko; Nakayama, Koji; Sato, Tatsuo; and Saito, Kazuo, 4,490,077, Cl. 406-14.000.

Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, to Hitachi, Ltd. Automatic slurry concentration control system. 4,490,044, Cl. 366-17.000.

Saito, Makoto: *See*—
Wyatt, Philip J.; Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,490,042, Cl. 356-340.000.

Saito, Ryusei: *See*—
Suzuki, Shohei; Kazawa, Yoshiaki; Saito, Ryusei; Noguchi, Koji; Moriai, Hidezumi; Mashiko, Ryoichi; and Sakai, Shuji, 4,490,578, Cl. 174-15.00S.

Saito, Tadao; and Tazaki, Takayuki, to Yoshino Kogyosho Co., Ltd. Manual liquid dispenser. 4,490,861, Cl. 222-207.000.

Saito, Takao, to Toyo Kabushiki Kaisha. Geographic display device for [illegible]e. 4,490,717, Cl. 340-996.000.

Saitoh, Keishi: *See*—
Misumi, Teruo; Ogawa, Hiroake, Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Shiga, Shigeru, 4,490,454, Cl. 430-84.000.

Saitou, Kouichi; Tohyama, Munroku; and Kosaka, Yoshikazu, to Toray Industries, Inc. Modification of polyester products. 4,490,149, Cl. 8-539.000.

Sakaguchi, Haruo; Seki, Hiroyo; and Yamamoto, Shu, to Kokusai Denshin Denwa Kabushiki Kaisha. Coupling system for output light of semiconductor laser. 4,490,020, Cl. 350-96.180.

Sakai, Shuji: *See*—
Suzuki, Shohei; Kazawa, Yoshiaki; Saito, Ryusei; Noguchi, Koji; Moriai, Hidezumi; Mashiko, Ryoichi; and Sakai, Shuji, 4,490,578, Cl. 174-15.00S.

Sakakibara, Eiichi: *See*—
Fujii, Setsuro; and Sakakibara, Eiichi, 4,490,366, Cl. 424-180.000.

Sakakibara, Hideo: *See*—
Fujiwara, Tatsuro; Watanabe, Hideyuki; Hirano, Takao; and Sakakibara, Hideo, 4,490,524, Cl. 536-7.100.

Sakamoto, Masakatsu: *See*—
Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,490,044, Cl. 366-17.000.
Wyatt, Philip J.; Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,490,042, Cl. 356-340.000.

Sakano, Hajime; Ito, Akitoshi; Yano, Motoichi; and Honda, Yasuhiro, to Sumitomo Naugatuck Co. Ltd. Thermoplastic resin composition. 4,490,506, Cl. 525-67.000.

Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Minami, Tamotsu; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, to Mitsui Toatsu Kagaki Kabushiki Kaisha. Thiazolylurea derivatives, a process for preparing

same and a pharmaceutical composition containing same. 4,490,393, Cl. 424-263.000.

Sakauchi, Takashi: *See*—
Yokota, Kenichi; Nishita, Shigeo; and Sakauchi, Takashi, 4,490,498, Cl. 524-371.000.

Sakharnov, Vasily A.: *See*—
Kuchuk-Yatsenko, Sergei I.; Krivenko, Valery G.; Bogorsky, Mikhail V.; Lazebny, Ivan L.; Porkhun, Fedor K.; Sakharnov, Vasily A.; and Cherednichok, Vitaly T., 4,490,081, Cl. 409-300.000.
Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; and Galian, Boris A., 4,490,599, Cl. 219-61.100.

Sakka, Hideo: *See*—
Kumoi, Sadakatsu; Sakka, Hideo; and Tsutsumi, Yukihiro, 4,490,556, Cl. 564-508.000.

Sako, Magoichi: *See*—
Maki, Yoshifumi; Sako, Magoichi; Mitsumori, Naomichi; Maeda, Sadayuki; and Takaya, Masahiro, 4,490,292, Cl. 260-239.30B.

Sakura Color Products Corp.: *See*—
Shioi, Keiko; and Shoji, Yukito, 4,490,177, Cl. 106-23.000.

Sakurai, Junji, to Fujitsu Limited. Process for producing a three-dimensional semiconductor device. 4,489,478, Cl. 29-574.000.

Sakurai, Yojiro: *See*—
Fujii, Setsuro; Aoyama, Takuo; Sakurai, Yojiro; Nakayama, Toyoo; Nunomura, Shigeki; Yaegashi, Takashi; and Okutome, Toshiyuki, 4,490,388, Cl. 424-278.000.

Salee, Gideon: *See*—
Kosanovich, George M.; and Salee, Gideon, 4,490,519, Cl. 528-179.000.

Salk Institute for Biological Studies, The: *See*—
Rivier, Jean E. F.; and Penke, Botond, 4,490,364, Cl. 424-177.000.

Salmon, Dennis J.: *See*—
Ramsay, Glynn R.; and Salmon, Dennis J., 4,490,446, Cl. 429-57.000.

Saltzman, Robert. Crushed ice making method and apparatus. 4,489,566, Cl. 62-73.000.

Salzmann, Ferdinand: *See*—
Wenkman, Gregory; and Salzmann, Ferdinand, 4,489,854, Cl. 221-202.000.

Sampson, Robert W.: *See*—
Pacanowski, Ronald F.; Sampson, Robert W.; and Kuchar, Paul J., 4,489,592, Cl. 73-30.000.

Sanchez, Jaime; and Sarin, Vinod K., to GTE Laboratories Incorporated. Insert for a mine tool roof bit and a method of drilling therewith. 4,489,796, Cl. 175-410.000.

Sanden Corporation: *See*—
Terauchi, Kiyoshi; and Hiraga, Masaharu, 4,490,099, Cl. 418-55.000.

Sanders, John T.; and Stewart, Donald L., to Cron Chemical Corporation. Mixing arrangement. 4,490,049, Cl. 366-134.000.

Sandis, Stylianos: *See*—
Bailly, Jean C.; and Sandis, Stylianos, 4,490,475, Cl. 502-156.000.

Sandoz Ltd.: *See*—
Heller, Juerg, 4,490,150, Cl. 8-610.000.

Sands, Robert E.: *See*—
Daghe, Joseph L.; Sands, Robert E.; and Humes, Dennis W., 4,489,746, Cl. 137-218.000.

Sandvik Special Metals Corp.: *See*—
Schemel, John H.; and Cady, A. Bruce, 4,489,497, Cl. 33-172.00E.

Saneyoshi, Norio: *See*—
Doi, Akiho; and Saneyoshi, Norio, 4,490,820, Cl. 370-100.000.

Sankyo Dengyo Kabushiki Kaisha: *See*—
Shimada, Katsuhiko; Nakayama, Koji; Sato, Tatsuo; and Saito, Kazuo, 4,490,077, Cl. 406-14.000.

Sano, Yoshiaki, to Fujitsu Limited. Differential amplifier. 4,490,685, Cl. 330-252.000.

Sanyo Electric Co., Ltd.: *See*—
Matsumoto, Hirofumi; Fujiwara, Masakatu; Tsuchida, Yasuyuki; and Miyazaki, Yoshifumi, 4,490,127, Cl. 474-110.000.

Sarin, Vinod K.: *See*—
Sanchez, Jaime; and Sarin, Vinod K., 4,489,796, Cl. 175-410.000.

Sarto, Julius A. Disposable utility blade. 4,489,489, Cl. 30-2.000.

Sartorius GmbH: *See*—
Nussbaumer, Dietmar; Perl, Horst; and Vinh, Khuong T., 4,490,256, Cl. 210-359.000.

Sato, Masanori: *See*—
Nakai, Taiichiro; Furusawa, Kahei; Sato, Masanori; Niiro, Yasuhiko; Ejiri, Yoshihiro; and Nunokawa, Makoto, 4,490,009, Cl. 350-96.230.

Sato, Shigetada: *See*—
Okudaira, Sadao; and Sato, Shigetada, 4,490,017, Cl. 350-427.000.

Sato, Tatsuo: *See*—
Shimada, Katsuhiko; Nakayama, Koji; Sato, Tatsuo; and Saito, Kazuo, 4,490,077, Cl. 406-14.000.

Satou, Hiroshi; and Yahagi, Tadao, to TDK Corporation. Electronic parts. 4,490,706, Cl. 336-96.000.

Satterwhite, Lawrence E. Underwater connector. 4,489,959, Cl. 285-18.000.

Satzler, Ronald L., to Caterpillar Tractor Co. Apparatus and method for controlling internal size of an extruded hose. 4,490,316, Cl. 264-40.700.

Savins, Joseph G., to Mobil Oil Corporation. In-situ uranium leaching process. 4,489,984, Cl. 299-5.000.

Savio & C. S.p.A.: *See*—
Calamani, Sergio; and Turri, Eugenio, 4,489,899, Cl. 242-47.010.

Scalise, Stanley J.: *See*—
Bruckler, Joseph M.; Gordon, James A., III; and Scalise, Stanley J., 4,490,039, Cl. 356-121.000.

Schafer, Gunter, to Security Lumber & Supply Co. Pipe clamp. 4,489,463, Cl. 24-277.000.

Schaib, Albert; Manogg, Horst; and Horl, Adolf, to Zahnradfabrik Friedrichshafen AG. Triaxial hinge for robots, handling apparatus and the like. 4,489,624, Cl. 74-479.000.

Schawann, Jean-Claude: *See*—
Caumont, Jean-Paul; and Schawann, Jean-Claude, 4,489,962, Cl. 285-263.000.

Schedler, Heinz: *See*—
Spielvogel, Harry; and Schedler, Heinz, 4,489,643, Cl. 91-515.000.

Scheinecker, Alois, to Voest-Alpine Aktiengesellschaft. Arrangement for measuring two oppositely arranged rollerways of a continuous casting plant. 4,489,495, Cl. 33-143.00L.

Schemel, John H.; and Cady, A. Bruce, to Sandvik Special Metals Corp. Groove measuring gauge. 4,489,497, Cl. 33-172.00E.

Schenk, Raymond L.: *See*—
McLane, Jack E.; Schenk, Raymond L.; and Wirtz, John W., 4,489,772, Cl. 164-423.000.

Schertz, Charles W.: *See*—
Bastian, Thomas W.; and Schertz, Charles W., 4,489,638, Cl. 89-1.815.

Schettler, Helmut: *See*—
Bluto, Arnold; and Schettler, Helmut, 4,490,673, Cl. 324-158.00R.

Schiehser, Guy A.; and Strike, Donald P., to American Home Products Corporation. Benzo-fused heterocyclic anti-ulcer agents. 4,490,527, Cl. 544-62.000.

Schlueter, Klaus, to Elastogran Maschinenbau GmbH. Apparatus for producing a preferably chemically reactive mixture from two or more plastics components. 4,490,048, Cl. 366-134.000.

Schlumberger Technology Corporation: *See*—
Chevalier, Philippe, 4,490,609, Cl. 250-269.000.
Rasmussen, Marvin W., 4,490,788, Cl. 364-200.000.

Schmidt, Dieter; Buschor, Josef; and Spilliner, Wayne K., to UI Group, Inc. Automatic french frying machine. 4,489,646, Cl. 99-330.000.

Schmidt, Harald: *See*—
Freudenschuss, Otto; Morell, Josef; Rollenitz, Leopold; and Schmidt, Harald, 4,490,098, Cl. 417-499.000.

Schmit, Joseph L.: *See*—
Nohava, Thomas E.; and Schmit, Joseph L., 4,490,441, Cl. 428-697.000.

Schmitt, Edgar: *See*—
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,489,698, Cl. 123-502.000.

Schmolka, Irving R., to BASF Wyandotte Corporation. Foam-stabilized compositions. 4,490,279, Cl. 252-357.000.

Schnabel, Wolfram: *See*—
Formanek, Lothar; Hirsch, Martin; Schnabel, Wolfram; Serbent, Harry; Fritzsche, Klaus-Dietrich; Koenig, Heribert; and Arlt, Detmar, 4,490,168, Cl. 75-10.00R.

Schnegelberger, Harald: *See*—
Behr, Norbert; van der Mei, Henk; Sirtl, Wolfgang; Schnegelberger, Harald; and von Ettingshausen, Othmar, 4,490,398, Cl. 426-312.000.

Schneider, Arthur C. Wrap around tool bar structure. 4,489,791, Cl. 172-776.000.

Schneider, Charles F.: *See*—
Coleman, Robert L.; and Schneider, Charles F., 4,490,131, Cl. 493-217.000.

Schneider, Egon, to KRONES AG Hermann Kronseder, Maschinenfabrik. Method and apparatus for transferring bottles arriving in upright position in laterally adjacent rows on a feed conveyor into a single row of bottles on a downstream conveyor. 4,489,820, Cl. 198-448.000.

Schneider, Irwin; and Guenzer, Charles S., to United States of America, Navy. Polarimetric image recorder. 4,490,016, Cl. 350-397.000.

Schoening, Josef; Schwiers, Hans-Georg; Elter, Claus; Stracke, Wilfried; and Kolodzey, Hans-Juergen, to Hochtemperatur-Reaktorbau GmbH. Bottom shield for a gas cooled high temperature nuclear reactor. 4,490,328, Cl. 376-285.000.

Scholl, Hans-Joachim; and Zenner, Armin, to Bayer Aktiengesellschaft. Process for the production of urethanes. 4,490,551, Cl. 560-025.000.

Schorr, Ian A., to Rockwell International. Reverse equalization network. 4,490,692, Cl. 333-28.00R.

Schovee, John R. Article for forming a picture frame. 4,489,512, Cl. 40-154.000.

Schreder, Felix: *See*—
Fischer, Karl; and Schreder, Felix, 4,490,603, Cl. 219-463.000.

Schreiber, Werner; and Marky, Michael, to Ciba-Geigy Corporation. Process for the preparation of a very pure commercial form of 4,2',4'-trichloro-2-hydroxydiphenyl ether. 4,490,562, Cl. 568-637.000.

Schroder, Ernst F., to Licentia Patent-Verwaltungs-G.m.b.H. Electronic amplifier. 4,490,687, Cl. 330-279.000.

Schubert, Herrmann; Deutscher, Hans-Joachim; Kresse, Horst; Demus, Dietrich; Altmann, Heinz; Korber, Marlies; and Bottger, Ute. Liquid crystal substituted trans-4-n-alkylcyclohexanes and subst.-3-subst.-benzoyloxy-[trans-4-n-alkylcyclohexane]s. 4,490,278, Cl. 252-299.630.

Schubert & Salzer: *See*—
Balz, Jurgen, 4,489,756, Cl. 137-625.330.

Schukin, Valery Y.: *See*—
Davidovich, Alexandr N.; Schukin, Valery Y.; Klushin, Valery A.; Sadko, Vladimir I.; Skrebets, Nikolai M.; and Murashko, Evgeny T., 4,489,581, Cl. 72-70.000.

Schulein, Rolf G.: *See*—
Deimel, Helmut; and Schulein, Rolf G., 4,489,457, Cl. 15-41.00R.
Schumacher, Edward B.: *See*—
Humphries, Michael J.; and Schumacher, Edward B., 4,490,333, Cl. 422-241.000.
Schumag GmbH, Firma: *See*—
Mostert, Johann, 4,489,582, Cl. 72-98.000.
Schuster, Friedrich; and Weigert, Hans, to FAG Kugelfischer Georg Schafer & Co. Friction false-twisting unit. 4,489,546, Cl. 57-340.000.
Schwaderer, Bernhard, to Licentia Patent-Verwaltungs-G.m.b.H. Monolithic input stage of an optical receiver. 4,490,735, Cl. 357-30.000.
Schwayder, Warren M. Street sweeper drag shoe. 4,489,458, Cl. 15-246.000.
Schweet, Richard R.: *See*—
Gasparaitis, Bernard V.; Krieg, Larry M.; Schweet, Richard R.; Williams, William R.; and Burbank, Raymond W., 4,490,813, Cl. 365-63.000.
Schwemberger, Michael. Arm band carrying device. 4,489,867, Cl. 224-222.000.
Schwer, John W. Steelmaking additive composition. 4,490,173, Cl. 75-58.000.
Schwiers, Hans-Georg: *See*—
Schoening, Josef; Schwiers, Hans-Georg; Elter, Claus; Stracke, Wilfried; and Kolodzey, Hans-Juergen, 4,490,328, Cl. 376-285.000.
Scientific Pharmaceutical, Inc.: *See*—
Orlowski, Jan A.; Butler, David V.; and Kidd, Patrick D., 4,490,115, Cl. 433-199.000.
Scoles, John, to Wisconsin Dairies Cooperative. Distribution device for butter filling system. 4,489,768, Cl. 141-71.000.
Scott Bader Company Limited: *See*—
Goring, John O., 4,490,503, Cl. 524-462.000.
Scott, James R.: *See*—
Charlebois, Leonard J.; Scott, James R.; and Barber, Robert J., 4,489,830, Cl. 206-316.000.
Scourtes, George, to Allen Group Inc., The. Apparatus for stopping articles on a conveyor. 4,489,824, Cl. 198-633.000.
Scovell, Peter D., to ITT Industries, Inc. Semiconductor processing technique for oxygen doping of silicon. 4,490,182, Cl. 148-1 500.
Scovell, Peter D., to ITT Industries, Inc. Method of reactivating implanted dopants and oxidation semiconductor wafers by microwaves. 4,490,183, Cl. 148-1.500.
SDS-Elektro GmbH: *See*—
Dietrich, Bernhard; Matsuahita, Hidetoshi; and Mori, Tetsuo, 4,490,701, Cl. 335-78.000.
Seal, J. David, to Autotrol Corporation. Microcomputer controlled demand/scheduled water softener. 4,490,249, Cl. 210-89.000.
Seamans, Ronald E.; and Behnke, Walter E., to Warner-Lambert Company. Phosphate salts of 1-[2-[(1-alkoxycarbonyl-3-aral..yl)-amino]-1-oxoalkyl]octahydro-1H-indole-2-carboxylic acids, preparation of, and medical compositions thereof. 4,490,386, Cl. 424-274.000.
Sebag, Henri; and Vanlerberghe, Guy, to L'Oreal. Surface-active polysiloxanes. 4,490,356, Cl. 424-70.000.
Security Lumber & Supply Co.: *See*—
Schafer, Gunter, 4,489,463, Cl. 24-277.000.
Seesale, Roland; and Maier, Werner, to Deutsche Babcock Anlagen Aktiengesellschaft. Pressure relief valve for containers. 4,489,754, Cl. 137-528.000.
Sehlin, Lars E.: *See*—
Hamilton, Raoul; Sehlin, Lars E.; and Svensson, Sten A., 4,489,678, Cl. 122-26.000.
Seki, Masaki: *See*—
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Mattina, Charles F., Jr.; and Selke, William A., 4,489,739, Cl. 131-352.000.
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Howes, John G. B.; and Selway, Rupert A., 4,490,330, Cl. 422-29.000.
Senatro, Clement A., to United Technologies Corporation. Flammable fluid leak deflector. 4,489,960, Cl. 285-45.000.
Senior, Roy: *See*—
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Sergeant, Timothy L., to Kendall Company, The. Laparotomy sponges. 4,490,146, Cl. 604-358.000.
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Mosser, Mark F.; McMordie, Bruce G.; and Fabiny, William J., 4,489,670, Cl. 118-55.000.
Sexton, James E.: *See*—
Duncan, Norman P. F.; and Sexton, James E., 4,490,400, Cl. 426-335.000.
Shahak, Israel: *See*—
Rubin, Ely J.; and Shahak, Israel, 4,490,523, Cl. 536-4.100.
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Shapess, Robert P., to Snyder General Corporation. Ground water heat pump system. 4,489,568, Cl. 62-324.100.
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Blackwood, Robert L.; and Shapiro, David M., 4,489,716, Cl. 128-77.000.
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Ollinger, James C.; and Shaub, Melvin H., 4,489,529, Cl. 52-732.000.
Shell Oil Company: *See*—
Bannon, Robert P., 4,490,215, Cl. 203-98.000.
Eckert, Rudolf J. A., 4,490,267, Cl. 252-56.00R.
Kipp, Robert M.; and Ayers, Ray R., 4,489,964, Cl. 285-374.000.
Li, Simon M.; and Lemley, Fred R., 4,490,511, Cl. 525-507.000.
Mikols, Wayne J., 4,490,493, Cl. 524-68.000.
Wegman, Richard W.; and Letts, John B., 4,490,559, Cl. 568-484.000.
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Dean, Richard T.; Dorn, Conrad P., Jr.; and Shen, Tsung-Ying, 4,490,303, Cl. 260-453.990.
Shenk, Edwin K., to Polaroid Corporation. Sonic autofocus camera having variable sonic beamwidth. 4,490,814, Cl. 367-140.000.
Shepherd, Charles G., to B. D. Wait Co. Limited. Drum humidifier. 4,490,311, Cl. 261-92.000.
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Ullrich, Ray D.; Sherman, Douglas C.; and Licon, Leo, Jr., 4,490,065, Cl. 403-379.000.
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Tsuda, Tetsuaki; Kurimoto, Tatsuo; and Shibuya, Atsuyoshi, 4,490,438, Cl. 428-613.000.
Shieh, Shin-Shi. Sports net apparatus. 4,489,941, Cl. 273-26.00A.
Shields, Steven E.; and Robinson, David A., to Hughes Aircraft Company. Method for repair of buried contacts in MOSFET devices. 4,489,479, Cl. 29-575.000.
Shigehara, Itaru: *See*—
Fujikawa, Kanichi; Tsujii, Yasuhiro; Shigehara, Itaru; Isogai, Tatsuo; Yoshizawa, Hiroshi; and Miyaji, Mikio, 4,490,534, Cl. 546-345.000.
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Shimada, Katsuhiko; Nakayama, Koji; Sato, Tatsuo; and Saito, Kazuo, to Nippon Kokan Kabushiki Kaisha; and Sankyo Dengyo Kabushiki Kaisha. Apparatus for continuously measuring flow rate of fine material flowing through transport pipe. 4,490,077, Cl. 406-14.000.
Shimaoogi, Toshio: *See*—
Shimoma, Taketoshi; Fukuda, Kumio; and Shimaoogi, Toshio, 4,490,644, Cl. 313-413.000.
Shimba, Satoru; Watanabe, Yoshikazu; Kato, Kazuo; and Yamashita, Kiyotoshi, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic materials. 4,490,460, Cl. 430-504.000.
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Shimp, David A., to Celanese Corporation. Stable blends of N,N-diglycidyl amines and polyglycidyl ethers of polyhydric phenols. 4,490,273, Cl. 252-182.000.
Shindow, Kenji; Uenaka, Akimitsu; Izumo, Takaharu; Fujishima, Teruyoshi; and Yamamoto, Satoshi, to Nippon Paint Co., Ltd. Coating composition. 4,490,417, Cl. 427-388.300.
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Han, Eui M., 4,489,600, Cl. 73-275.000.
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Shinoda, Naoharu: *See*—
Ito, Yoshifumi; Yanagi, Kenichi; Shinoda, Naoharu; and Higaki, Seiji, 4,490,161, Cl. 55-181.000.
Shinohara, Hiroichi, to Ricoh Company, Ltd. Wide angle copying lens with high aperture efficiency. 4,490,019, Cl. 350-464.000.
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Inomata, Masashi; Kon, Shizuo; Kaku, Tsukasa; and Shinohara, Shizuo, 4,490,833, Cl. 378-58.000.

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Shioi, Keiko; and Shoji, Yukito, to Sakura Color Products Corp. Dual color ink composition. 4,490,177, Cl. 106-23.000.
Shionoya, Hiroshi; Takeuchi, Hitoshi; and Funatsu, Gunki, to Eisai Co., Ltd. Immunopotentiator comprising the B chain of ricin as an active ingredient. 4,490,362, Cl. 424-177.000.
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Misumi, Teruo; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Shirai, Shigeru, 4,490,454, Cl. 430-84.000.
Shneider, Benjamin L.: *See*—
Winzenburg, Mark L.; Fields, Ellis K.; and Shneider, Benjamin L., 4,490,545, Cl. 549-234.000.
Shoji, Yukito: *See*—
Shioi, Keiko; and Shoji, Yukito, 4,490,177, Cl. 106-23.000.
Shoshin, Vadim M.: *See*—
Grebenkin, Mikhail F.; Ivashenko, Alexandr V.; Karamysheva, Ljudmila A.; Blinov, Lev M.; Kovshev, Evgeny I.; Shtykov, Nikolai M.; Titov, Viktor V.; Shoshin, Vadim M.; Agafonova, Irina F.; and Barnik, Mikhail I., 4,490,277, Cl. 252-299.600.
Showa Highpolymer Co., Ltd.: *See*—
Takiyama, Eiichiro; Tsukui, Toshikazu, deceased; Morita, Katsuhisa; and Takano, Seiichi, 4,490,410, Cl. 427-44.000.
Shropshire, Robin D., to Phillips Petroleum Company. Dyeable polymer alloy fibers containing a polymeric dye-receptor and a metal salt of a carboxylic acid. 4,490,494, Cl. 524-87.000.
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Shu, Winston R., to Mobil Oil Corporation. Viscous oil recovery method. 4,489,783, Cl. 166-272.000.
Shure Brothers, Inc.: *See*—
Kehl, Joseph D., 4,490,816, Cl. 369-55.000.
Siciliano, Anthony J., to Diamond Automations, Inc. Scraper assembly. 4,489,675, Cl. 119-22.000.
Siemens Aktiengesellschaft: *See*—
Meinherz, Manfred; and Tietze, Jorg, 4,490,595, Cl. 200-254.000.
Mueller, Erwin, 4,490,705, Cl. 335-276.000.
Pascher, Helmut, 4,490,422, Cl. 428-36.000.
Tiemann, Wilhelm; and Verleger, Jobst, 4,490,594, Cl. 200-148.00R.
Wilhelm, Wilhelm, 4,490,669, Cl. 323-313.000.
Wons, Heinz, 4,490,835, Cl. 378-146.000.
Sigg, Hans, to MAAG Gear-Wheel & Maschine Company Limited. Clutch arrangement for a marine vessel drive. 4,489,816, Cl. 192-3.230.
SIGMA koncern: *See*—
Svercl, Josef; Novak, Jan; and Zampach, Stepan, 4,489,588, Cl. 72-402.000.
Signorelli, John A. Breakway meter pointers and shafts. 4,490,672, Cl. 324-110.000.
Sih, John C., to Upjohn Company, The. 9-Substituted carbacyclin analogs. 4,490,555, Cl. 562-501.000.
Siller, David, to Texaco Inc. Probe type paraffin monitor. 4,490,679, Cl. 324-446.000.
Silver, Robert S., to RCA Corporation. Storage device having a semiconductor target. 4,490,643, Cl. 313-391.000.
Silvern, Rubin D. Carpule syringe with rapidly acting mechanism for controllably positively retaining the hub of a hypodermic needle. 4,490,142, Cl. 604-241.000.
Simelunas, William J.: *See*—
Albrecht, Robert J.; Ignatuk, Daniel; Pinto, Albert A.; and Simelunas, William J., 4,489,632, Cl. 83-404.200.
Simm, Hans-Peter; and Guhne, Wieland, to Vorwerk & Co. Interholding GmbH. Drive unit for a cleaning device. 4,489,620, Cl. 74-42.000.
Simmons U.S.A. Corporation: *See*—
St. Clair, Albert R., 4,490,090, Cl. 414-567.000.
Simmons Universal Corporation. *See*—
Failor, Raymond A.; and Kabdebo, Otto Z., 4,489,449, Cl. 5-86.000.
Simon, Eli. Self-extinguishing cigarettes. 4,489,738, Cl. 131-349.000.
Simon, Nikolaus, to Robert Bosch GmbH. Method and fuel supply system for fuel supply to a mixture-compressing internal combustion engine with externally supplied engine. 4,489,701, Cl. 123-531.000.
Simon Population Trust: *See*—
Casey, Donn; and Fiishie, Gilbert M., 4,489,725, Cl. 128-346.000.
Simons, Elliot; and Boulos, Robert. Swimming apparatus. 4,489,723, Cl. 128-207.160.
Simpson, Anthony Y.: *See*—
Moore, Robert G.; Simpson, Anthony Y.; and Keefe, Howard W., 4,489,667, Cl. 114-67.00A.
Sines, Roger B.; Field, Thomas T.; and Papineau, Patrick F., to United Technologies Corporation. Thermal-mechanical working of wrought non-hardenable nickel alloy. 4,490,186, Cl. 148-11.50N.
Singer Company, The: *See*—
Arnold, Bruce E., 4,490,656, Cl. 318-434.000.
Laidig, Manfred R., 4,489,961, Cl. 285-116.000.
Singhi, Dilip T., to Rauland-Borg Corporation. Master/slave clock system. 4,490,050, Cl. 368-46.000.
Single Buoy Moorings Inc.: *See*—
Coppens, Anton; and Poldervaart, Leendert, 4,490,121, Cl. 441-5.000.
Sirch, Edgar; and Vicariesmann, Jurgen, to Glatt Maschinen - und Apparatebau AG. Air conditioned room and method for using same. 4,489,645, Cl. 98-36.000.
Sirtl, Wolfgang: *See*—
Behr, Norbert; van der Mei, Henk; Sirtl, Wolfgang; Schnegelberger, Harald; and von Ettingshausen, Othmar, 4,490,398, Cl. 426-312.000.
Siskin, Michael, to Exxon Research and Engineering Co. Process for beneficiating oil-shale. 4,490,238, Cl. 208-11.0LE.
Sitte, Helmuth, to C. Reichert Optische Werke AG. Cooling apparatus for the rapid cooling of specimens. 4,489,569, Cl. 62-514.00R.
SKF Kugellagerfabriken GmbH: *See*—
Brandenstein, Manfred; Ernst, Horst M.; Walter, Lothar; and Kaschube, Karl-Friedrich, 4,489,992, Cl. 384-496.000.
Skoog, Malte. Plate heat exchanger. 4,489,778, Cl. 165-166.000.
Skrebets, Nikolai M.: *See*—
Davidovich, Alexandr N.; Schukin, Valery Y.; Klushin, Valery A.; Sadko, Vladimir I.; Skrebets, Nikolai M.; and Murashko, Evgeny T., 4,489,581, Cl. 72-70.000.
Skudelny, Dieter; and Rauth, Gerhard, to Ciba-Geigy AG. Flowable mixture and use of synthetic calcium silicate. 4,490,492, Cl. 523-443.000.
Skurkovich, Boris: *See*—
Skurkovich, Simon V.; and Skurkovich, Boris, 4,490,357, Cl. 424-85.000.
Skurkovich, Simon V.; and Skurkovich, Boris. Simplified in-vitro interferon production. 4,490,357, Cl. 424-85.000.
Skutecki, Edmund R.: *See*—
Griffith, Carl D.; Rauschelbach, Paul A.; Robinson, Robert W.; and Skutecki, Edmund R., 4,490,794, Cl. 364-433.000.
Skytop Brewster Company: *See*—
Cummins, Bruce M., 4,489,526, Cl. 52-125.600.
Slavin, Martin J., to Intech Systems Corp. Computerized audiometer. 4,489,610, Cl. 73-585.000.
Sliva, Robert F. Ultrasonically welded pompons. 4,490,419, Cl. 428-4.000.
Slobodin, Leo: *See*—
Opitz, Charles L.; and Slobodin, Leo, 4,490,718, Cl. 343-5.0SA.
Smead, Robert G., to Caterpillar Tractor Co. Electrostatic spray gun. 4,489,893, Cl. 239-691.000.
Smith, Enoch P., to Allen-Bradley Company. Automatic torque taper circuit. 4,490,657, Cl. 318-434.000.
Smith, Jeffrey G., to Irontite Products Co., Inc. Pad clamp for closing off water port in engine block. 4,489,594, Cl. 73-49.700.
Smith, Kenneth G., to Thorn EMI Gas Appliances Limited. Gas fires. 4,489,707, Cl. 126-127.000.
Smith Kline & French Laboratories Limited: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., 4,490,387, Cl. 424-274.000.
Smith, Michael J.: *See*—
Piccolini, Richard J.; and Smith, Michael J., 4,490,476, Cl. 502-203.000.
Smith, Robert A., to General Electric Company. Completely solventless two component RTV silicone composition. 4,490,500, Cl. 524-378.000.
Smith, Roderick A.: *See*—
Chaplin, George B. B.; and Smith, Roderick A., 4,490,841, Cl. 381-71.000.
Smith, Ronald A.: *See*—
Gordon, Ronald F.; and Smith, Ronald A., 4,490,001, Cl. 339-17.0CF.
Smith, Stanley K., to Eaton Corporation. Quality control method. 4,489,617, Cl. 73-862.190.
Smither, Miles A.: *See*—
Lockett, James F.; Smither, Miles A.; and Janecka, Jerry F., 4,490,606, Cl. 250-227.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Spielvogel, Harry; and Schedler, Heinz, 4,489,643, Cl. 91-515.000.
Snap-on Tools Corporation: *See*—
Christophersen, Steven L., 4,489,498, Cl. 33-180.0AT.
Snider, Harold F.; and Risacher, Gerard H., to Therm-O-Disc, Incorporated. Thermally responsive switching device. 4,490,704, Cl. 337-372.000.
Snyder, Clair W., Jr.: *See*—
Asick, John C.; Douty, George H.; Goodman, Joseph R.; Jones, Kermit M., Jr.; Landis, John M.; Snyder, Clair W., Jr.; Woratyla, John A.; and Zell, Dale R., 4,489,998, Cl. 339-17.0LM.
Snyder General Corporation: *See*—
Shapess, Robert P., 4,489,568, Cl. 62-324.100.
Snyder, Troxell K.; and Chase, Paul H., to Combustion Engineering, Inc. Method and apparatus for controlling a gasifier. 4,489,562, Cl. 60-667.000.
Societe Anonyme D.B.A.: *See*—
Carre, Jean-Jacques; Courbot, Pierre; and Levrai, Roland, 4,490,102, Cl. 418-201.000.
Societe Anonyme Dite: Vide et Traitement: *See*—
Speri, Roger, 4,490,190, Cl. 148-16.600.
Societe d'Assistance Technique pour Produits Nestle S. A.: *See*—
Akesson, Yngve R., 4,489,735, Cl. 130-30.00H.
Hsu, Jau Y.; Wedral, Elaine R.; and Klinker, William J., 4,490,396, Cl. 426-49.000.
Lunder, Tito L.; and Nielsen, Corine M., 4,490,402, Cl. 426-422.000.
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Badertscher, Ernest; and Grobety, Pierre, 4,489,887, Cl. 239-132.100.

Societe Nationale ELF Aquitaine: *See*—
Cabrit, Philippe; Mourlevat, Jean; and de Saint-Palais, Jacques, 4,489,472, Cl. 29-426.500.
Societe Nationale Elf Aquitaine (Production): *See*—
Caumont, Jean-Paul; and Schawann, Jean-Claude, 4,489,962, Cl. 285-263.000.
Lazarre, Flavien; and Bruneau, Jean, 4,490,106, Cl. 431-90.000.
Soderberg, Paul B. Oilwell pump system and method. 4,490,095, Cl. 417-46.000.
Soederberg, Richard, to Ing. h.c.F. Porsche AG. Actuating mechanism for an auxiliary power source. 4,489,904, Cl. 244-75.00R.
Sohn, Tong-Hoon. Low frequency transformer. 4,490,844, Cl. 381-104.000.
Solid State Measurements, Inc.: *See*—
Mazur, Robert G., 4,489,521, Cl. 51-161.000.
Sony Corporation: *See*—
Asaida, Takashi, 4,490,738, Cl. 358-50.000.
Himuro, Masami; Nishigaki, Susumu; and Terunuma, Kazuhiko, 4,490,739, Cl. 358-66.000.
Hoshino, Mitsuo; and Yamamoto, Takashi, 4,490,763, Cl. 360-132.000.
Kono, Takashi; Kakuyama, Shinji; and Kamai, Toshimitsu, 4,490,751, Cl. 358-330.000.
Yamada, Takaaki, 4,490,734, Cl. 357-23.000.
Yoshinaka, Tadaaki, 4,490,750, Cl. 358-320.000.
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Pisecky, Jan; Krag, Jens; and Sorensen, Ib H., 4,490,403, Cl. 426-453.000.
Sorenson, Paul D.; and McNichols, Larry A., to Medtronic, Inc. Ultrasound imaging system. 4,489,729, Cl. 128-660.000.
Sound Attenuators Limited: *See*—
Chaplin, George B. B.; and Smith, Roderick A., 4,490,841, Cl. 381-71.000.
Southern Elastic Corporation: *See*—
Boling, Terry L., 4,489,541, Cl. 57-16.000.
Sovey, James S.: *See*—
Mirtich, Michael J.; Sovey, James S.; and Banks, Bruce A., 4,490,229, Cl. 204-192.00C.
Spadini, Gianfranco L.; Larrabee, Antoinette L.; and Liu, Don K. K., to Procter & Gamble Company, The. Detergent compositions containing polyethylene glycol and polyacrylate. 4,490,271, Cl. 252-174.230.
Spatz, David M.; and Cross, Barrington, to American Cyanamid Company. Meta-(phenylalkoxy)phenyl-N-methoxy-N-methylurea compounds, methods for preparing same and herbicidal use thereof. 4,490,165, Cl. 71-88.000.
Spector, Donald. Manipulating play elements in liquid cell. 4,489,939, Cl. 273-1.00L.
Spendel, Wolfgang U., to Proctor & Gamble Company, The. Method for highly efficient laundering of textiles. 4,489,455, Cl. 8-158.000.
Spendel, Wolfgang U., to Procter & Gamble Company, The. Apparatus for highly efficient laundering of textiles. 4,489,574, Cl. 68-16.000.
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Peterson, Bruce W.; Speranza, George P.; and Grigsby, Robert A., Jr., 4,490,485, Cl. 521-48.000.
Speri, Roger, to Societe Anonyme Dite: Vide et Traitement. Process for thermochemical treatments of metals by ionic bombardment. 4,490,190, Cl. 148-16.600.
Sperry Corporation: *See*—
Feldman, Alan S., 4,490,655, Cl. 318-294.000.
Griffith, Carl D.; Rauschelbach, Paul A.; Robinson, Robert W.; and Skutecki, Edmund R., 4,490,794, Cl. 364-433.000.
Kroger, Harry, 4,490,733, Cl. 357-5.000.
Miller, Harry, 4,490,793, Cl. 364-433.000.
Miller, Harry, 4,490,802, Cl. 364-567.000.
Naaktgeboren, Adrianus, 4,489,648, Cl. 100-191.000.
Rao, B. Rama; and Robbins, Kenneth W., 4,489,601, Cl. 73-290.00R.
Van Overschelde, Daniel M., 4,489,734, Cl. 130-27.00R.
Spevack, Jerome S. System for producing steam and mechanical energy from a hydrothermal. 4,489,561, Cl. 60-641.500.
SPICA S.p.A.: *See*—
Roca-Nierga, Manuel, 4,489,694, Cl. 123-449.000.
Spielvogel, Harry; and Schedler, Heinz, to SMS Schloemann-Siemag Aktiengesellschaft. Safety control device for protecting hydraulically supported loads against uncontrolled lowering and lifting. 4,489,643, Cl. 91-515.000.
Spillner, Wayne K.: *See*—
Schmidt, Dieter; Buschor, Josef; and Spillner, Wayne K., 4,489,646, Cl. 99-330.000.
Spinal Dynamics, Inc.: *See*—
Morrow, Winston G., 4,489,982, Cl. 297-458.000.
Spiral Societe a Responsabilite Limitee dite: *See*—
Collange, Edmond; Paris, Michel; and Autissier, Nicole, 4,490,221, Cl. 204-72.000.
Spitler, Lynn E., to Xoma Corporation. Composition and method for transplantation therapy. 4,489,710, Cl. 128-1.00R.
Spokas, Romas B.; and Sturges, Fred D., to Borg-Warner Corporation. Engine temperature control system. 4,489,680, Cl. 123-41.050.
Spranger, Douglas M.: *See*—
Lacko, Mark A.; Brooks, Malcolm J.; Spranger, Douglas M.; and Mitchell, Peter P., 4,490,141, Cl. 604-180.000.
Square D Company: *See*—
Cook, James W., 4,490,593, Cl. 200-144.00R.
SRI International: *See*—
Dawson, Marcia I.; and Chan, Rebecca L. S., 4,490,414, Cl. 424-312.000.
Stadler, Karl: *See*—
Bunk, Axel; and Stadler, Karl, 4,490,646, Cl. 313-579.000.
Staggs, Kevin P.; and Clarke, Charles J., Jr., to Honeywell Inc. Method and apparatus for controlling the display of a computer generated raster graphic system. 4,490,797, Cl. 364-522.000.
Stamps, Kenneth H.; and Watson, Clifford A. Food frying and dispensing apparatus. 4,489,647, Cl. 99-336.000.
Standard Oil Company, The: *See*—
Coffey, Gerald P.; Sentman, Robert C.; and Curatolo, Benedict S., 4,490,521, Cl. 528-336.000.
Standard Oil Company (Indiana): *See*—
Winzenburg, Mark L.; Fields, Ellis K.; and Shneider, Benjamin L., 4,490,545, Cl. 549-234.000.
Standard Products Company, The: *See*—
Martin, Richard D., 4,489,921, Cl. 267-141.500.
Stapp, Paul R.; and Chaney, Mary B., to Phillips Petroleum Company. N,N-Disubstituted amide cosurfactants in enhanced oil recovery processes. 4,490,263, Cl. 252-8.55D.
Starks, Charles M.: *See*—
Yang, Kang; Starks, Charles M.; and Kerfoot, O. Carl, 4,490,561, Cl. 568-615.000.
Staten, Walter T., to Kennecott Corporation. Fused cast high chrome refractory and method for manufacturing same. 4,490,474, Cl. 501-115.000.
Staudenmaier, Klaus: *See*—
Hasler, Werner; Padmanabhan, Subramaniam; and Staudenmaier, Klaus, 4,489,650, Cl. 101-93.140.
Staufenberg, Charles W.: *See*—
Echols, John C.; and Staufenberg, Charles W., 4,490,639, Cl. 310-319.000.
Stauffer Chemical Company: *See*—
Hyzak, Daniel L., 4,490,166, Cl. 71-100.000.
Stauffer, Randall C.; and Paszlor, Andrew J., to Dow Chemical Company, The. Method of servicing wellbores. 4,490,262, Cl. 252-8.55R.
Ste Francaise des Produits pour Catalyse chez Institut Francais du Petrole: *See*—
Boitiaux, Jean-Paul; and Cosyns, Jean, 4,490,481, Cl. 502-330.000.
Stecker, Glenroy, to Great Lakes Carbon Corporation. Production of premium grade petroleum coke. 4,490,244, Cl. 208-131.000.
Stedef S.A.: *See*—
Harmsen, John L., 4,489,884, Cl. 238-1.000.
Steely, Simon, Jr.: *See*—
Ives, David C.; Miller, David K.; and Steely, Simon, Jr., 4,490,784, Cl. 364-200.000.
Steffes, Helmut: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Steffes, Helmut; Bleckmann, Hans-Wilhelm; Goossens, Andre F. L.; van Kelst, Willi; and Weise, Lutz, 4,489,989, Cl. 303-92.000.
Steg, Robert F., Jr. Extracorporeal blood processing system. 4,490,331, Cl. 422-46.000.
Stegemoeller, Calvin L.; and Walker, Lonnie R., to Halliburton Company. Constant level additive mixing system. 4,490,047, Cl. 366-132.000.
Steigerwald, Carl J., to Kendall Company, The. Urine drainage receptacle with a normally open reflux valve. 4,490,144, Cl. 604-323.000.
Steinberger, Josef, to Paul Forkardt GmbH & Co. KG. Device for measuring clamping force. 4,489,619, Cl. 73-862.650.
Steinbruegge, Kenneth B.; and Gottlieb, Milton S., to Westinghouse Electric Corp. Automated acousto-optic infrared analyzer system. 4,490,845, Cl. 382-1.000.
Stekly, Zdenek J. J.; and Strauss, Bruce P., to Magnetic Corporation of America. Superconductor with improved persistence characteristics. 4,490,439, Cl. 428-614.000.
Stelzner, Charles D.: *See*—
Miller, Paul H.; and Stelzner, Charles D., 4,490,587, Cl. 200-5.00A.
Stern, Alvin S., to Hoffmann-La Roche Inc. Homogeneous human interleukin 2. 4,490,289, Cl. 260-112.00R.
Stern, Richard A.; and Babbitt, Richard W., to United States of America, Army. Dielectric waveguide ferrite modulator/switch. 4,490,700, Cl. 333-258.000.
Sterzer, Fred, to RCA Corporation. Microwave radiator utilizing solar energy. 4,490,668, Cl. 322-2.00R.
Stevens, Russell E., to Cameron Iron Works, Inc. Valve and stem seal therefor. 4,489,916, Cl. 251-214.000.
Stevenson, Robert C.; Enright, Michael G.; and Nodwell, Bruce. Valve assembly. 4,489,914, Cl. 251-147.000.
Stewart, Donald L.: *See*—
Sanders, John T.; and Stewart, Donald L., 4,490,049, Cl. 366-134.000.
Stewart, Geraldine L. Aid and method for remedial reading instruction. 4,490,118, Cl. 434-178.000.
Steyr-Daimler-Puch Aktiengesellschaft: *See*—
Freudenschuss, Otto; Morell, Josef; Rollenitz, Leopold; and Schmidt, Harald, 4,490,098, Cl. 417-499.000.
Stimson, Frank P. Method for producing a painting. 4,490,413, Cl. 427-262.000.
Stipdonk, Gustaaf, to Petro-Canada Exploration Inc.; Her Majesty the Queen in right of the Providence of Alberta, Alberta Oil Sands Equity; PanCanadian Petroleum Limited; Esso Resources Canada Limited; Canada-Cities Service, Ltd.; Gulf Canada Limited; Alberta Energy Company, Ltd.; Hudson's Bay Oil and Gas Company Limited; and Petrofina Canada Inc. Device for splicing cable ends. 4,489,828, Cl. 198-847.000.
Stockton, Ronald J.; and Munson, Robert E., to Ball Corporation. Monolithic microwave integrated circuit with integral array antenna. 4,490,721, Cl. 343-368.000.

Stojanow, Georgi: *See*—
Lippold, Gerhard; Thurner, Gunther; and Stojanow, Georgi, 4,489,511, Cl. 38-55.000.
Stonham, Thomas J.: *See*—
Aleksander, Igor; Stonham, Thomas J.; and Wilkie, Bruce A., 4,490,847, Cl. 382-10.000.
Stow & Davis Furniture Company: *See*—
Byrne, Norman R., 4,489,997, Cl. 339-13.000.
Stracke, Wilfried: *See*—
Schoening, Josef; Schwiers, Hans-Georg; Elter, Claus; Stracke, Wilfried; and Kolodzey, Hans-Juergen, 4,490,328, Cl. 376-285.000.
Straka, Richard B.: *See*—
Becker, Kenneth W.; Friedrichs, Louis G., Jr.; Kropp, Lev; and Straka, Richard B., 4,490,401, Cl. 426-407.000.
Straslicka, William A., to Elliott Turbomachinery Co., Inc. Method of providing a multivalve turbine nozzle ring interface seal. 4,489,468, Cl. 29-156.80R.
Strauss, Bruce P.: *See*—
Stekly, Zdenek J. J.; and Strauss, Bruce P., 4,490,439, Cl. 428-614.000.
Strecker, William D.; Thompson, David; and Casabona, Richard, to Digital Equipment Corporation. Dual path bus structure for computer interconnection. 4,490,785, Cl. 364-200.000.
Strike, Donald P.: *See*—
Schichter, Guy A.; and Strike, Donald P., 4,490,527, Cl. 544-62.000.
Struttmann, Hilarious S.; Donahue, Kenneth R.; and Cooper, Paul W., to Emerson Electric Co. Method of constructing a drive tensioning device. 4,489,475, Cl. 29-526.00R.
Stuart, Jerry E.: *See*—
Michaels, Leonard H.; and Stuart, Jerry E., 4,489,490, Cl. 30-90.100.
Sturges, Fred D.: *See*—
Spokas, Romas B.; and Sturges, Fred D., 4,489,680, Cl. 123-41.050.
Sturges, Robert H., Jr., to Westinghouse Electric Corp. Vernier press brake die set. 4,489,587, Cl. 72-389.000.
Suarez, Jose I.: *See*—
Borras, Jaime A.; Suarez, Jose I.; and Victor, Alan M., 4,490,688, Cl. 331-1.00A.
Suciu, George D.: *See*—
Sze, Morgan C. Y.; and Suciu, George D., 4,490,153, Cl. 44-56.000.
Suda, Yoshihide: *See*—
Tanaka, Susumu; Daisaku, Takehiko; and Suda, Yoshihide, 4,490,112, Cl. 433-20.000.
Sudani, Yasuo, to Tokyo Emix Corporation. X-ray apparatus. 4,490,834, Cl. 378-110.000.
Suehiro Seiko Kabushiki Kaisha: *See*—
Tsumura, Toshihiro, 4,489,493, Cl. 30-387.000.
Suematsu, Toshio: *See*—
Ito, Yoshiyasu; Suematsu, Toshio; Takeda, Yuji; Anzai, Katsushi; and Yoshida, Matsuji, 4,489,688, Cl. 123-339.000.
Suerken, Hans P.: *See*—
Amort, Jurgen; Hanisch, Horst; Klapdor, Ute; Suerken, Hans P.; and van der Maas, Hendrikus, 4,490,526, Cl. 536-102.000.
Sugar, Janos: *See*—
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Honty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos, 4,490,378, Cl. 424-262.000.
Sugie, Toshinori: *See*—
Kawabata, Juheiji; Inoue, Toshio; Sugie, Toshinori; and Kobata, Fumihiro, 4,490,522, Cl. 528-388.000.
Sugishita, Nobuyuki: *See*—
Tosaki, Hiromi; Sugishita, Nobuyuki; and Ikegami, Akira, 4,490,429, Cl. 428-195.000.
Sugiura, Masamichi, to Minolta Camera Kabushiki Kaisha. Abnormality detecting device for the original carriage of a copying machine. 4,490,035, Cl. 355-8.000.
Sugizaki, Iwao: *See*—
Mizuno, Ichiro; and Sugizaki, Iwao, 4,489,496, Cl. 33-172.00R.
Sulzer Brothers Limited: *See*—
Grotloh, Karlheinz, 4,490,836, Cl. 376-281.000.
Sumitomo Chemical Company, Limited: *See*—
Fukushima, Nobuo; Nakae, Kiyohiko; and Terazawa, Takayuki, 4,490,502, Cl. 524-445.000.
Hayatsu, Hikoya; and Tezuka, Yasuo, 4,490,525, Cl. 536-54.000.
Sumitomo Electric Industries, Ltd.: *See*—
Murakami, Kazuhito; and Takahashi, Kenichi, 4,490,008, Cl. 350-96.340.
Sumitomo Metal Industries, Ltd.: *See*—
Tsuda, Tetsuaki; Kurimoto, Tatsuo; and Shibuya, Atsuyoshi, 4,490,438, Cl. 428-613.000.
Sumitomo Naugatuck Co. Ltd.: *See*—
Sakano, Hajime; Ito, Akitoshi; Yano, Motoichi; and Honda, Yasuhiro, 4,490,506, Cl. 525-67.000.
Sump, Cord H., to Combustion Engineering, Inc. Process for bonding refractory to surfaces. 4,489,877, Cl. 228-178.000.
Sundstrand Corporation: *See*—
Hunsberger, Dale L.; and Harwath, Frank L., 4,490,105, Cl. 431-65.000.
Sung, Rodney L.; Yeakey, Ernest L.; Foucher, Walter D., Jr.; and Cuscurida, Michael, to Texaco Inc. Fuels containing an alkenylsuccinyl polyglycolcarbonate ester as a deposit-control additive. 4,490,154, Cl. 44-70.000.
Surgikos, Inc.: *See*—
Morris, Henrietta K.; and Lagergren, Esther R., 4,489,720, Cl. 128-132.00D.
Susumu, Kawabata; Hiroshi, Niimi; Meiji, Anahara; and Hiroshi, Omori, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Method and apparatus for producing a fasciated yarn. 4,489,545, Cl. 57-333.000.
Suszynski, Edward D.: *See*—
Kopsho, Joseph D., Jr.; Suszynski, Edward D.; and Johnson, Reginald S., 4,490,710, Cl. 338-128.000.
Sutherland, Karl M.: *See*—
Gordon, Lucas S.; and Sutherland, Karl M., 4,490,254, Cl. 210-247.000.
Suzuki, Daiji: *See*—
Takeuchi, Hideo; Kobayashi, Michiaki; Hashimoto, Hiroyuki; and Suzuki, Daiji, 4,489,652, Cl. 101-211.000.
Suzuki, Hirosuki, to Junkosha Company, Ltd. Strip line cable. 4,490,690, Cl. 333-1.000.
Suzuki, Shohei; Kazawa, Yoshiaki; Saito, Ryusei; Noguchi, Koji; Moriai, Hidezumi; Mashiko, Ryoichi; and Sakai, Shuji, to Hitachi Cable, Ltd.; and Hitachi, Ltd. Integrated superconductor. 4,490,578, Cl. 174-15.00S.
Suzuki, Tomio; Tamura, Setsuo; Tanaka, Kozo; Hirose, Ryoichi; Komatsu, Hiroyuki; Tamada, Shinichi; Kasai, Taketsugu; and Tanimoto, Keisuke, to Kobe Steel, Limited. Method and apparatus for injecting pulverized fuel into a blast furnace. 4,490,171, Cl. 75-42.000.
Suzuki, Yoshihisa: *See*—
Hasegawa, Junzo; Kawabata, Susumu; Moriuchi, Mitsunori; and Suzuki, Yoshihisa, 4,489,461, Cl. 19-258.000.
Svensson, Sten A.: *See*—
Hamilton, Raoul; Sehlin, Lars E.; and Svensson, Sten A., 4,489,678, Cl. 122-26.000.
Svercl, Josef; Novak, Jan; and Zampach, Stepan, to SIGMA koncern. Apparatus for manufacturing screw workpieces of a tube semiproduct. 4,489,588, Cl. 72-402.000.
Swartz, John C.: *See*—
Lawrence, John T.; and Swartz, John C., 4,490,004, Cl. 339-95.00R.
Sweeney, William T., to Conoco Inc. Electrically actuated servocontrol system for a static pressure operated load. 4,489,757, Cl. 137-877.000.
Swift, Gregory W.: *See*—
Wheatley, John C.; Swift, Gregory W.; and Migliori, Albert, 4,489,553, Cl. 60-516.000.
Syntex (U.S.A.) Inc.: *See*—
Chowhan, Zaka-Ud-Din T., 4,490,377, Cl. 424-256.000.
Jones, Gordon H.; Venuti, Michael C.; Alvarez, Robert; and Bruno, John J., 4,490,371, Cl. 424-248.540.
Sypal, Kenneth L.: *See*—
Peerenboom, B. David; and Sypal, Kenneth L., 4,490,614, Cl. 250-385.000.
Szabo, Lajos: *See*—
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Honty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos, 4,490,378, Cl. 424-262.000.
Szabolcsi, Tamas: *See*—
Ambrus, Dezso ; Szabolcsi, Tamas; and Hutas, Istvan, 4,490,394, Cl. 426-2.000.
Szala, Lawrence E.: *See*—
Lee, Minyoung; Borom, Marcus P.; and Szala, Lawrence E., 4,490,319, Cl. 264-65.000.
Szantay, Csaba: *See*—
Dancsi, Lajos; Keve, Tibor; Fekete, Gyorgy; Dezseri, Eszter; Gorog, Sandor; Acs, Tibor; Szantay, Csaba; Szabo, Lajos; Honty, Katalin; Eckhardt, Sandor; Hindi, Ivan; Kerpel-Fronius, Sandor; Relle nee Somfa, Zsuzsanna; and Sugar, Janos, 4,490,378, Cl. 424-262.000.
Sze, Morgan C. Y.; and Suciu, George D., to Lummus Crest Inc. Process for the production of gasohol. 4,490,153, Cl. 44-56.000.
Tabacek, Joseph A.: *See*—
Vogel, Roger F.; Rennard, Raymond J.; and Tabacek, Joseph A., 4,490,479, Cl. 502-309.000.
Vogel, Roger F.; Rennard, Raymond J.; and Tabacek, Joseph A., 4,490,483, Cl. 502-309.000.
Tacklind, Christopher A.: *See*—
Vaught, John L.; Cloutier, Frank L.; Donald, David K.; Meyer, John D.; Tacklind, Christopher A.; and Taub, Howard H., 4,490,728, Cl. 346-1.100.
Tafara, Peter T. Filter bag with removable ring and handle and method of assembly therefor. 4,490,253, Cl. 210-238.000.
Tai, Seiji: *See*—
Kawakami, Masato; and Tai, Seiji, 4,490,436, Cl. 428-403.000.
Taiyo Yuden Co., Ltd.: *See*—
Masuyama, Masaru; Hirooka, Susumu; and Yamaoka, Nobutatsu, 4,490,318, Cl. 264-61.000.
Takagi, Matao: *See*—
Watabe, Tomiji; Kondo, Hideo; Matsuda, Toshihiko; Yano, Kenji; Dote, Yasuhiko; and Takagi, Matao, 4,490,621, Cl. 290-42.000.
Takahashi, Kenichi: *See*—
Murakami, Kazuhito; and Takahashi, Kenichi, 4,490,008, Cl. 350-96.340.
Takahashi, Kihei, to Yoshida Kogyo K. K. Tool for attaching a coupling element to a concealed slide fastener. 4,489,486, Cl. 29-769.000.

Takano, Seiichi: *See*—
Takiyama, Eiichiro; Tsukui, Toshikazu, deceased; Morita, Katsuhisa; and Takano, Seiichi, 4,490,410, Cl. 427-44.000.
Takara Co., Ltd.: *See*—
Ogawa, Iwakichi, 4,490,124, Cl. 446-464.000.
Takase, Yasuhide, to Yamada Dobby Co., Ltd. Leveling device of dobby machine. 4,489,763, Cl. 139-329.000.
Takashima, Hiroaki: *See*—
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, 4,490,239, Cl. 208-44.000.
Takaya, Masahiro: *See*—
Maki, Yoshifumi; Sako, Magoichi; Mitsumori, Naomichi; Maeda, Sadayuki; and Takaya, Masahiro, 4,490,292, Cl. 260-239.30B.
Takeda Chemical Industries, Ltd.: *See*—
Fujino, Masahiko, 4,490,291, Cl. 260-112.5LH.
Takeda, Fumio; Ishida, Osami; and Isoda, Yoji, to Mitsubishi Denki Kabushiki Kaisha. Crossed waveguide type polarization separator. 4,490,696, Cl. 333-137.000.
Takeda, Yuji: *See*—
Ito, Yoshiyasu; Suematsu, Toshio; Takeda, Yuji; Anzai, Katsuhi; and Yoshida, Matsuji, 4,489,688, Cl. 123-339.000.
Takegahara, Takashi: *See*—
Kishi, Hajimu; Seki, Masaki; Tanaka, Kunio; and Takegahara, Takashi, 4,490,781, Cl. 364-191.000.
Takehiko Disaku: *See*—
Tanaka, Susumu; Daisaku, Takehiko; and Suda, Yoshihide, 4,490,112, Cl. 433-20.000.
Takeshima, Takahiko; Ueki, Tadashi; Kawashima, Motozo; Ueno, Thuneo; and Nishimoto, Masayuki, to UBE Industries, Ltd. Gas-venting arrangement incorporated with a mold. 4,489,771, Cl. 164-305.000.
Takeuchi, Hideo; Kobayashi, Michiaki; Hashimoto, Hiroyuki; and Suzuki, Daiji, to Dai Nippon Insatsu Kabushiki Kaisha. Method, system, and plate bending machine for registering in an offset printing press. 4,489,652, Cl. 101-211.000.
Takeuchi, Hiroshi; Jyo mura, Shigeru; Nagatsuma, Kazuyuki; Hikita, Mitsutaka; Ito, Yukio; and Ashida, Sakichi, to Hitachi, Ltd. Three electrode piezoelectric ceramic resonator. 4,490,641, Cl. 310-366.000.
Takeuchi, Hitoshi: *See*—
Shionoya, Hiroshi; Takeuchi, Hitoshi; and Funatsu, Gunki, 4,490,362, Cl. 424-177.000.
Takiyama, Eiichiro; Tsukui, Toshikazu, deceased (by Tsukui, Kiyoko, legal representative); Morita, Katsuhisa; and Takano, Seiichi, to Showa Highpolymer Co., Ltd. Method of affixing a decorative pattern to a stock or a molded component. 4,490,410, Cl. 427-44.000.
Tamada, Shinichi: *See*—
Suzuki, Tomio; Tamura, Setsuo; Tanaka, Kozo; Hirose, Ryoichi; Komatsu, Hiroyuki; Tamada, Shinichi; Kasai, Taketsugu; and Tanimoto, Keisuke, 4,490,171, Cl. 75-42.000.
Tamamushi, Masahiro, to Nissan Motor Company, Limited. Foldable panel for storage space of an automotive vehicle or the like. 4,489,660, Cl. 108-44.000.
Tamba, Shinichi: *See*—
Fujikawa, Tetsuzo; Hirata, Makizo; and Tamba, Shinichi, 4,490,309, Cl. 261-52.000.
Tamura, Fumio: *See*—
Kinoshita, Mitsutaka; Nakagami, Tatsuro; Murakami, Nobuaki; Endo, Norio; Tamura, Fumio; and Danno, Yoshiaki, 4,489,685, Cl. 123-198.00F.
Tamura, Poohsan N., to Honeywell Inc. High speed multiply accumulate processor. 4,490,805, Cl. 364-728.000.
Tamura, Setsuo: *See*—
Suzuki, Tomio; Tamura, Setsuo; Tanaka, Kozo; Hirose, Ryoichi; Komatsu, Hiroyuki; Tamada, Shinichi; Kasai, Taketsugu; and Tanimoto, Keisuke, 4,490,171, Cl. 75-42.000.
Tanabe Seiyaku Co., Ltd.: *See*—
Ikezaki, Muneyoshi; Kanno, Takeshi; Iwai, Hajime; and Inamasu, Masanori, 4,490,392, Cl. 424-330.000.
Tanaka, Harumi; Ueda, Hiroshi; Maeda, Keisuke; and Yoshizaki, Akira, to Minolta Camera Kabushiki Kaisha. Camera with a framing mirror. 4,490,029, Cl. 354-106.000.
Tanaka, Katsumi, to Rion Kabushiki Kaisha. Hearing aid. 4,490,585, Cl. 179-107.0FD.
Tanaka, Kazunobu; Matsuda, Akihisa; and Yoshida, Toshihiko, to Agency of Industrial Science and Technology. Method of producing thin films of silicon. 4,490,208, Cl. 156-606.000.
Tanaka, Kazuo: *See*—
Tanaka, Toru; Hataya, Masanori; and Tanaka, Kazuo, 4,490,554, Cl. 562-486.000.
Tanaka, Kozo: *See*—
Suzuki, Tomio; Tamura, Setsuo; Tanaka, Kozo; Hirose, Ryoichi; Komatsu, Hiroyuki; Tamada, Shinichi; Kasai, Taketsugu; and Tanimoto, Keisuke, 4,490,171, Cl. 75-42.000.
Tanaka, Kunio: *See*—
Kishi, Hajimu; Seki, Masaki; Tanaka, Kunio; and Takegahara, Takashi, 4,490,781, Cl. 364-191.000.
Tanaka, Susumu; Daisaku, Takehiko; and Suda, Yoshihide, to Kabushiki Kaisha Suwa Seikosha; and Takehiko Disaku. Orthodontic system and method. 4,490,112, Cl. 433-20.000.
Tanaka, Toru; Hataya, Masanori; and Tanaka, Kazuo, to Mitsubishi Gas Chemical Company, Inc. Process for crystallizing trimellitic acid. 4,490,554, Cl. 562-486.000.
Tanamachi, Tokunosuke; Narita, Hiroshi; Ibamoto, Masahiko; and Okamatsu, Shigetoshi, to Hitachi, Ltd. Control of induction motor using PWM inverter. 4,490,666, Cl. 318-800.000.
Tani, Haruhisa: *See*—
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,489,630, Cl. 83-15.000.
Taniguchi, Hideo: *See*—
Tatsumi, Yutaka; and Taniguchi, Hideo, 4,489,485, Cl. 29-620.000.
Tanimoto, Keisuke: *See*—
Suzuki, Tomio; Tamura, Setsuo; Tanaka, Kozo; Hirose, Ryoichi; Komatsu, Hiroyuki; Tamada, Shinichi; Kasai, Taketsugu; and Tanimoto, Keisuke, 4,490,171, Cl. 75-42.000.
Tanner, Eugene J.: *See*—
Tanner, Stephen E.; and Tanner, Eugene J., 4,490,777, Cl. 362-221.000.
Tanner, Stephen E.; and Tanner, Eugene J. Selective color illumination device for electronic drafting tables. 4,490,777, Cl. 362-221.000.
Tanno, Seikichi: *See*—
Mackawa, Iwao; Omori, Eiji; Uchigasaki, Isao; Tobita, Hideyuki; Yokoyama, Naoki; Tanno, Seikichi; Nakano, Fumio; and Ito, Ren, 4,490,496, Cl. 524-317.000.
Tapco Products Company, Inc.: *See*—
Rhoades, James J., 4,489,583, Cl. 72-319.000.
Tarankov, Gennady A.: *See*—
Shamarokov, Alexandr S.; Kuzmin, Alexei V.; Glebov, Vladimir P.; Moskvichev, Viktor F.; Morozova, Nadezhda A.; Filippov, Gennady A.; Tarankov, Gennady A.; Lukasevich, Boris I.; Andreev, Leonid M.; and Grishakov, Viktor I., 4,489,788, Cl. 122-32.000.
Tatsumi, Yutaka; and Taniguchi, Hideo, to Rohm Company Limited. Method for forming a thermal printing head. 4,489,485, Cl. 29-620.000.
Tatsumichi, Toshio: *See*—
Kawarada, Hiroshi; Tatsumichi, Toshio; Wakahata, Yasuo; Hamanaka, Mitsuyoshi; and Kajitani, Tamotsu, 4,490,015, Cl. 350-340.000.
Taub, Howard H.: *See*—
Vaught, John L.; Cloutier, Frank L.; Donald, David K.; Meyer, John D.; Tacklind, Christopher A.; and Taub, Howard H., 4,490,728, Cl. 346-1.100.
Taylor, Donald M.; and Whittaker, Thomas H. Featherless arrow. 4,489,949, Cl. 273-423.000.
Taylor, Philip E., to General Motors Corporation. Sliding window latch. 4,489,965, Cl. 292-34.000.
Taylor, Robert S.: *See*—
Gall, Owen M.; Thomson, Thomas L.; and Taylor, Robert S., 4,489,584, Cl. 72-327.000.
Taylor, Roderick S.; Leopold, Kurt E.; and Alcock, A. John, to Canadian Patents & Development Limited. Laser triggered high voltage rail gap switch. 4,490,651, Cl. 315-150.000.
Taylor, Theodore B., to Nova, Inc. Process cooling method and apparatus utilizing aerosol sprays. 4,489,565, Cl. 62-59.000.
Tazaki, Takaharu: *See*—
Saito, Tadao; and Tazaki, Takaharu, 4,489,861, Cl. 222-207.000.
Tchernev, Dimiter I. Process of preparing magnetic spinel ferrite having accurate predetermined transition temperature. 4,490,268, Cl. 252-62.620.
TDK Corporation: *See*—
Satou, Hiroshi; and Yahagi, Tadao, 4,490,706, Cl. 336-96.000.
Techsight Corp.: *See*—
Weber, Hermann, 4,490,495, Cl. 524-264.000.
Tecl, Bohuslav: *See*—
Knoke, Jurgen; Jost, Manfred; Tecl, Bohuslav; and Fahrbach, Erich, 4,490,425, Cl. 428-90.000.
Teijin Limited: *See*—
Shigeru, Futami; Koji, Tajiri; and Kazushige, Hayashi, 4,490,433, Cl. 428-262.000.
Tektronix, Inc.: *See*—
Olmstead, Harold W., 4,490,653, Cl. 315-403.000.
Zimmerman, Robert R.; Kunkler, Larry D.; and Helderman, Earl R., 4,490,408, Cl. 427-42.000.
Teledyne Industries, Inc.: *See*—
Rounion, William A.; and Modlin, Phillip R., 4,490,722, Cl. 343-394.000.
Tempmaster Corporation: *See*—
Dean, Raymond H.; and Roberts, Michael M., 4,489,881, Cl. 236-49.000.
Teramachi, Hiroshi. Recirculating-ball linear bearing assembly with a pair of opposed guide rails. 4,489,990, Cl. 308-6.00C.
Terauchi, Kiyoshi; and Hiraga, Masaharu, to Sanden Corporation. Scroll type fluid displacement apparatus with thickened center wrap portions. 4,490,099, Cl. 418-55.000.
Terazawa, Takayuki: *See*—
Fukushima, Nobuo; Nakae, Kiyohiko; and Terazawa, Takayuki, 4,490,502, Cl. 524-445.000.
Terentieva, Evgenia A.: *See*—
Volynets, Filipp K.; Demidenko, Vladimir A.; Denisov, Roman A.; Denx, Viktor P.; Dydelzak, Alexandr E.; Ryzhikov, Engels N.; and Terentieva, Evgenia A., 4,490,286, Cl. 252-583.000.
Termolar S/A: *See*—
De Freitas, Elias M., 4,489,840, Cl. 215-13.00R.
Terpatra, Daniel A.; and Brundage, Richard, to Emerson Electric Co. Sawdust collector bag for a table saw. 4,489,909, Cl. 248-99.000.
Terrell, Christopher E., to MC2 Ltd. Suspension filing means. 4,489,836, Cl. 211-45.000.
Terrot Strickmaschinen GmbH: *See*—
Engelfried, Werner; and Muller, Gerhard, 4,489,573, Cl. 66-8.000.

Terukatsu Miyauchi: *See*—
Miyauchi, Terukatsu; Ikeda, Yoneichi; and Kikuchi, Tatsuji, 4,490,243, Cl. 208-127.000.
Terumo Corporation: *See*—
Yoshida, Takao, 4,490,420, Cl. 428-35.000.
Terunuma, Kazuhiko: *See*—
Himuro, Masami; Nishigaki, Susumu; and Terunuma, Kazuhiko, 4,490,739, Cl. 358-66.000.
Texaco Development Corporation: *See*—
Quintana, Manuel E.; and Estabrook, Lawrence E., 4,490,251, Cl. 210-209.000.
Texaco Inc.: *See*—
Davis, Lorne A., Jr.; Brost, Dale F.; and Haskin, Helen K., 4,490,676, Cl. 324-376.000.
Kaufman, Benjamin J., 4,490,155, Cl. 44-71.000.
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,490,156, Cl. 48-61.000.
Mead, Theodore C.; and Wright, James H., 4,490,245, Cl. 208-179.000.
Peterson, Bruce W.; Speranza, George P.; and Grigsby, Robert A., Jr., 4,490,485, Cl. 521-48.000.
Siller, David, 4,490,679, Cl. 324-446.000.
Sung, Rodney L.; Yeakey, Ernest L.; Foucher, Walter D., Jr.; and Cuscurida, Michael, 4,490,154, Cl. 44-70.000.
Texas Instruments Incorporated: *See*—
Everett, Chauncey L.; Houston, Theodore W.; and Darley, Henry M., 4,490,632, Cl. 307-475.000.
Hartman, Dennis C., 4,490,209, Cl. 156-643.000.
Jones, Gary W., 4,489,481, Cl. 29-591.000.
McDonough, Kevin C.; and Bellay, Jeffrey D., 4,490,783, Cl. 364-200.000.
McElroy, David J., 4,490,736, Cl. 357-41.000.
Textron Inc: *See*—
Moore, Robert G.; Simpson, Anthony Y.; and Keefe, Howard W., 4,489,667, Cl. 114-67.00A.
Tezuka, Yasuo: *See*—
Hayatsu, Hikoya; and Tezuka, Yasuo, 4,490,525, Cl. 536-54.000.
Thackrey, James D. Counting cap for medicine bottles. 4,489,834, Cl. 206-534.000.
Thees, John E.: *See*—
Korte, Jay S.; and Thees, John E., 4,489,853, Cl. 221-187.000.
Therm-O-Disc, Incorporated: *See*—
Snider, Harold F.; and Risacher, Gerard H., 4,490,704, Cl. 337-372.000.
Theurer, Jose; and Riessberger, Klaus, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile apparatus for determining the lateral position of a railroad track. 4,490,038, Cl. 356-5.000.
Thiokol Corporation: *See*—
Inman, Frank S., 4,489,889, Cl. 239-265.330.
Thirion, Paul J., to L. B. Industries, Inc. Luggage rack. 4,489,868, Cl. 224-321.000.
Thivend, Jean: *See*—
Gourdon, Claude; and Thivend, Jean, 4,490,712, Cl. 340-347.0DD.
Thomas, Gerald F.: *See*—
Forcht, Brennan A.; and Thomas, Gerald F., 4,490,184, Cl. 148-6.210.
Thomas, Michael E.: *See*—
Keyser, Thomas; Thomas, Michael E.; Pierce, John M.; and Cleeves, James M., 4,489,482, Cl. 29-591.000.
Thompson, Darrell R.: *See*—
Beroff, Howard; Thompson, Darrell R.; Mericle, Robert W.; and Travis, William C., Jr., 4,490,326, Cl. 264-328.160.
Thompson, David: *See*—
Strecker, William D.; Thompson, David; and Casabona, Richard, 4,490,785, Cl. 364-200.000.
Thompson, James C. Portable hinged transducer carrier. 4,489,454, Cl. 5-503.000.
Thompson, Mortimer S., to Tri-Tech Systems International, Inc. Tamper evident closures and packages. 4,489,841, Cl. 215-203.000.
Thompson, Paige W.; and Kelly, Ronald W., to General Electric Company. Condition responsive electric switch system, electrical switching device and method of operation thereof. 4,490,708, Cl. 337-320.000.
Thomson, Bruce J., to Union Carbide Australia, Limited. Incorporation of liquid additives into polymeric films. 4,490,323, Cl. 264-211.000.
Thomson C.S.F.: *See*—
Bensussan, Andre; Birot, Patrice; Van Kerrebroeck, Claude; and Curtinot, Jean-Claude, 4,490,854, Cl. 455-118.000.
Thomson, Thomas L.: *See*—
Gall, Owen M.; Thomson, Thomas L.; and Taylor, Robert S., 4,489,584, Cl. 72-327.000.
Thorn EMI Gas Appliances Limited: *See*—
Smith, Kenneth G., 4,489,707, Cl. 126-127.000.
Thurner, Gunther: *See*—
Lippold, Gerhard; Thurner, Gunther; and Stojanow, Georgi, 4,489,511, Cl. 38-55.000.
Thycho Fredin AB: *See*—
Fredin, Sture, 4,489,975, Cl. 296-181.000.
Thyssen Industrie AG: *See*—
Hausler, Peter; and Nathrath, Norbert, 4,489,564, Cl. 62-48.000.
Tiemann, Wilhelm; and Verleger, Jobst, to Siemens Aktiengesellschaft. High voltage circuit breaker. 4,490,594, Cl. 200-148.00R.
Tietze, Jorg: *See*—
Meinherz, Manfred; and Tietze, Jorg, 4,490,595, Cl. 200-254.000.
Tigers Polymer Corporation: *See*—
Yamamura, Michio, 4,489,759, Cl. 138-122.000.
Tillander, Hans: *See*—
Ekbladh, Fred V. G.; and Tillander, Hans, 4,490,136, Cl. 604-22.000.
Titov, Viktor V.: *See*—
Grebenkin, Mikhail F.; Ivashenko, Alexandr V.; Karamysheva, Ljudmila A.; Blinov, Lev M.; Kovshev, Evgeny I.; Shtykov, Nikolai M.; Titov, Viktor V.; Shoshin, Vadim M.; Agafonova, Irina F.; and Barnik, Mikhail I., 4,490,277, Cl. 252-299.600.
Titzer, Robert A., to Burlington Industries, Inc. Stack creeling system and method of continuously creeling yarn. 4,489,903, Cl. 242-131.000.
Tobia, Alfonso J.: *See*—
Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,490,374, Cl. 424-251.000.
Tobita, Hideyuki: *See*—
Maekawa, Iwao; Omori, Eiji; Uchigasaki, Isao; Tobita, Hideyuki; Yokoyama, Naoki; Tanno, Seikichi; Nakano, Fumio; and Ito, Ren, 4,490,496, Cl. 524-317.000.
Tohyama, Shunroku: *See*—
Saitou, Kouichi; Tohyama, Shunroku; and Kosaka, Yoshikazu, 4,490,149, Cl. 8-539.000.
Tokuda, Hiroshi: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Misami, Tamotsu; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,490,393, Cl. 424-263.000.
Tokuyama, Yoshio, to Victor Company of Japan, Ltd. Recording and reproducing video signals at selectable different tape traveling speeds from plural video head pairs. 4,490,755, Cl. 360-70.000.
Tokyo Emix Corporation: *See*—
Sudani, Yasuo, 4,490,834, Cl. 378-110.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Goto, Kuniaki, 4,490,680, Cl. 329-117.000.
Jingu, Masaharu, 4,489,730, Cl. 128-660.000.
Kawai, Tsuneo, 4,489,507, Cl. 34-77.000.
Ogura, Mitsugi, 4,490,628, Cl. 307-449.000.
Yasuda, Hiroshi; and Ochii, Kiyofumi, 4,490,697, Cl. 333-156.000.
Yokoyama, Makoto, 4,490,747, Cl. 358-296.000.
Yotuyanagi, Masahiko; and Fukaya, Toshio, 4,490,412, Cl. 427-122.000.
Tokyo Shibaura Denki Kobashiki Kaisha: *See*—
Shimoma, Taketoshi; Fukuda, Kumio; and Shimaoogi, Toshio, 4,490,644, Cl. 313-413.000.
Tolliver, Wilbur E. Cage spacer. 4,489,528, Cl. 52-677.000.
Tombal, Gerard; and Pagnucco, Gilbert, to Boussois S.A. Device for handling articles in the form of sheets. 4,489,835, Cl. 211-41.000.
Tominoi, Kunitada: *See*—
Tomita, Akira; and Tominoi, Kunitada, 4,490,574, Cl. 174-36.000.
Tomita, Akira; and Tominoi, Kunitada, to AMP Incorporated. Electrical cable. 4,490,574, Cl. 174-36.000.
Tomlinson, Harold W., Jr.: *See*—
Beall, Donald L.; and Tomlinson, Harold W., Jr., 4,490,848, Cl. 382-121.000.
Tomm, Donald: *See*—
Wienhold, Edgar K.; and Tomm, Donald, 4,489,869, Cl. 224-329.000.
Tomy Kogyo Co., Inc.: *See*—
Hatakeyama, Morichika; and Minami, Koichi, 4,489,944, Cl. 273-154.000.
Toppan Printing Co. Ltd.: *See*—
Ogura, Daisuke; and Fujiu, Shosuke, 4,490,132, Cl. 493-424.000.
Topwave Instruments Oy: *See*—
Tormala, Sauli J., 4,490,612, Cl. 250-339.000.
Toray Industries, Inc.: *See*—
Fukuhara, Mototada; Ono, Keizo; Morita, Ken-ichi; and Fujii, Shigeru, 4,490,828, Cl. 373-117.000.
Saitou, Kouichi; Tohyama, Shunroku; and Kosaka, Yoshikazu, 4,490,149, Cl. 8-539.000.
Torii & Co., Ltd.: *See*—
Fujii, Setsuro; Aoyama, Takuo; Sakurai, Yojiro; Nakayama, Toyoo; Nunomura, Shigeki; Yaegashi, Takashi; and Okutome, Toshiyuki, 4,490,388, Cl. 424-278.000.
Torii, Nobutoshi: *See*—
Inaba, Hajimu; and Torii, Nobutoshi, 4,489,821, Cl. 198-472.000.
Tormala, Sauli J., to Topwave Instruments Oy. Method for the measurement of the properties of a plastic film by means of infra-red radiation. 4,490,612, Cl. 250-339.000.
Torstensson, Arne B.: *See*—
Gorton, Lo G.; Jaegfeldt, Hans Å.; Torstensson, Arne B.; and Johansson, Gillis R., 4,490,464, Cl. 435-4.000.
Tosaki, Hiromi; Sugishita, Nobuyuki; and Ikegami, Akira, to Hitachi, Ltd. Process for manufacturing a multilayer circuit board. 4,490,429, Cl. 428-195.000.
Toshiba Kikai Kabushiki Kaisha: *See*—
Ogura, Daisuke; and Fujiu, Shosuke, 4,490,132, Cl. 493-424.000.
Tsukimoto, Toshiaki; Matsunaga, Chiharu; and Hashimoto, Yutaka, 4,489,644, Cl. 91-530.000.
Tosoni, Anthony L., to Polydex Chemicals Ltd. Process for the separation and purification of dextranase. 4,490,470, Cl. 435-211.000.
Towers, John E.; and Edwards, Robert E. Mine tool bit with spring loaded button retainer. 4,489,987, Cl. 299-86.000.
Toyo Jozo Kabushiki Kaisha: *See*—
Fujiwara, Tatsuro; Watanabe, Hideyuki; Hirano, Takao; and Sakakibara, Hideo, 4,490,524, Cl. 536-7.100.

Toyo Seikan Kaisha, Ltd.: *See*—
Yamada, Morio, 4,489,767, Cl. 141-48.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Kumoi, Sadakatsu; Sakka, Hideo; and Tsutsumi, Yukihiro, 4,490,556, Cl. 564-508.000.
Toyota, Akinori: *See*—
Minami, Syuji; Toyota, Akinori; and Kashiwa, Norio, 4,490,513, Cl. 526-128.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Ito, Yoshiyasu; Suematsu, Toshio; Takeda, Yuji; Anzai, Katsushi; and Yoshida, Matsuji, 4,489,688, Cl. 123-339.000.
Kobayashi, Nobuyuki; Itoh, Hiroshi; and Hattori, Takashi, 4,489,696, Cl. 123-493.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ono, Hironobu; Nakano, Jiro; and Nagase, Masaomi, 4,489,691, Cl. 123-424.000.
Saito, Takao, 4,490,717, Cl. 340-996.000.
Shinoda, Kazuo, 4,490,790, Cl. 364-424.100.
Traex Corporation: *See*—
Wenkman, Gregory; and Salzmann, Ferdinand, 4,489,854, Cl. 221-202.000.
Transmission Research, Inc.: *See*—
White, Graham, 4,489,625, Cl. 74-665.00C.
Trapani, Vittorio: *See*—
Glembin, Dirk; Kappler, Fritz-Robert; Curatolo, Luigi; and Trapani, Vittorio, 4,490,343, Cl. 423-336.000.
Trapp, Dennis L.: *See*—
Mattson, William F.; and Trapp, Dennis L., 4,490,325, Cl. 264-315.000.
Travers, Mark D.: *See*—
Turban, Martin M.; Moore, Lyman T.; and Travers, Mark D., 4,490,824, Cl. 373-93.000.
Travis, William C., Jr.: *See*—
Beroff, Howard; Thompson, Darrell R.; Mericle, Robert W.; and Travis, William C., Jr., 4,490,326, Cl. 264-328.160.
TRE Corporation: *See*—
Mullich, Richard O.; and Dushane, Ray, 4,489,576, Cl. 70-134.000.
Treiber, Fritz F., to Hobart Corporation. Package handling in a film wrapping machine. 4,489,533, Cl. 53-228.000.
Trevarrow, David. Method of making a wheel. 4,490,079, Cl. 408-1.00R.
Tri-Tech Systems International, Inc.: *See*—
Thompson, Mortimer S., 4,489,841, Cl. 215-203.000.
Tronseur, Jean-Francois, to Espada Anstalt. Process for manufacturing an ignition device for an internal combustion engine, and ignition device obtained thereby. 4,490,122, Cl. 445-7.000.
Troncoso, Fernando, Jr. Archery bow with adjustable arrow support. 4,489,704, Cl. 124-24.00R.
Troutner, Vernon H., to Extracorporeal Medical Specialties, Inc. Dual phase blood flow system and method of operation. 4,490,134, Cl. 604-5.000.
Troutner, Vernon H., to Extracorporeal Medical Specialties, Inc. Single needle alternating blood flow system. 4,490,135, Cl. 604-5.000.
Tsai, Lung-Wen; and Johnson, Thomas J., to General Motors Corporation. Engine with crank mounted balancer for secondary shaking forces. 4,489,683, Cl. 123-192.00B.
Tsao, George T.: *See*—
Gong, Cheng Shung; Chen, Li Fu; Flickinger, Michael C.; and Tsao, George T., 4,490,468, Cl. 435-161.000.
Tsarenko, Pavel I.: *See*—
Prikhodko, Valery V.; Kostyrkin, Boris V.; and Tsarenko, Pavel I., 4,490,180, Cl. 134-1.000.
Tsuboi, Toshihide: *See*—
Kai, Tomokazu; and Tsuboi, Toshihide, 4,490,830, Cl. 375-40.000.
Tsuchida, Yasuyuki: *See*—
Matsumoto, Hirofumi; Fujiwara, Masakatu; Tsuchida, Yasuyuki; and Miyazaki, Yoshifumi, 4,490,127, Cl. 474-110.000.
Tsuchihashi, Akira, to Hitachi, Ltd. Safety system and method for a robot. 4,490,660, Cl. 318-565.000.
Tsuda, Tadashi; Hiramatsu, Seiichirou; Maeno, Tsuyoshi; and Ohtsuka, Mitsugi, to Nippondenso Co., Ltd. Ultrasonic distance detector. 4,490,716, Cl. 340-904.000.
Tsuda, Tetsuaki; Kurimoto, Tatsuo; and Shibuya, Atsuyoshi, to Sumitomo Metal Industries, Ltd. Steel sheet with multilayer electroplating and method of producing same. 4,490,438, Cl. 428-613.000.
Tsujii, Yasuhiro: *See*—
Fujikawa, Kanichi; Tsujii, Yasuhiro; Shigehara, Itaru; Isogai, Tatsuo; Yoshizawa, Hiroshi; and Miyaji, Mikio, 4,490,534, Cl. 546-345.000.
Tsukimoto, Toshiaki; Matsunaga, Chiharu; and Hashimoto, Yutaka, to Toshiba Kikai Kabushiki Kaisha. Multiple control valves. 4,489,644, Cl. 91-530.000.
Tsukui, Kiyoko, legal representative: *See*—
Takiyama, Eiichiro; Tsukui, Toshikazu, deceased; Morita, Katsuhisa; and Takano, Seiichi, 4,490,410, Cl. 427-44.000.
Tsukui, Toshikazu, deceased: *See*—
Takiyama, Eiichiro; Tsukui, Toshikazu, deceased; Morita, Katsuhisa; and Takano, Seiichi, 4,490,410, Cl. 427-44.000.
Tsumura, Toshihiro, to Suehiro Seiko Kabushiki Kaisha. Chain saw guide bar. 4,489,493, Cl. 30-387.000.
Tsunekawa, Takahiko: *See*—
Morita, Takayuki; and Tsunekawa, Takahiko, 4,489,544, Cl. 57-261.000.
Tsutsui, Yoshitaka: *See*—
Hasegawa, Hiroshi; Tsutsui, Yoshitaka; Horikawa, Yoshinori; and Miyakawa, Seii, 4,489,993, Cl. 312-7.200.
Tsutsumi, Yukihiro: *See*—
Kumoi, Sadakatsu; Sakka, Hideo; and Tsutsumi, Yukihiro, 4,490,556, Cl. 564-508.000.
Turban, Martin M.; Moore, Lyman T.; and Travers, Mark D., to Great Lakes Carbon Corporation. Composite electrode for arc furnace. 4,490,824, Cl. 373-93.000.
Turner, Jan R.: *See*—
Cooper, Robin D. G.; Biaszczak, Larry C.; and Turner, Jan R., 4,490,370, Cl. 424-246.000.
Turner, Jonathan S., to AT&T Bell Laboratories. Packet error rate measurements by distributed controllers. 4,490,817, Cl. 370-17.000.
Turner, Peter J.; and Morrissey, Neal J., to General Binding Corporation. Apparatus for shredding documents. 4,489,897, Cl. 241-167.000.
Turner, Roland J., to AT&T Bell Laboratories. Signal level detector with automatic switching between extended linear and square law dynamic ranges. 4,490,681, Cl. 329-179.000.
Turri, Eugenio: *See*—
Calamani, Sergio; and Turri, Eugenio, 4,489,899, Cl. 242-47.010.
Twin Y Corporation: *See*—
Young, William S., 4,489,517, Cl. 49-382.000.
Tyler, Loren E., to Lor-Al Corporation. Apparatus for distributing a substance. 4,489,892, Cl. 239-650.000.
Tyler Refrigeration Corporation: *See*—
Barr, Roger W., 4,489,995, Cl. 312-236.000.
Tyndale Plains-Hunter, Ltd.: *See*—
Gould, Francis E.; and Johnston, Christian W., 4,490,423, Cl. 428-36.000.
UBE Industries, Ltd.: *See*—
Iwai, Tadashi; Mizuno, Hisayuki; and Miura, Masao, 4,490,344, Cl. 423-341.000.
Ogasa, Masao; Nishiyama, Masao; and Ohtsuki, Kaoru, 4,490,520, Cl. 528-315.000.
Takeshima, Takahiko; Ueki, Tadashi; Kawashima, Motozo; Ueno, Thuneo; and Nishimoto, Masayuki, 4,489,771, Cl. 164-305.000.
Uchida, Kenji: *See*—
Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,490,044, Cl. 366-17.000.
Wyatt, Philip J.; Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,490,042, Cl. 356-340.000.
Uchigasaki, Isao: *See*—
Maekawa, Iwao; Omori, Eiji; Uchigasaki, Isao; Tobita, Hideyuki; Yokoyama, Naoki; Tanno, Seikichi; Nakano, Fumio; and Ito, Ren, 4,490,496, Cl. 524-317.000.
Ueda, Hiroshi: *See*—
Tanaka, Harumi; Ueda, Hiroshi; Maeda, Keisuke; and Yoshizaki, Akira, 4,490,029, Cl. 354-106.000.
Ueda, Kohichi; Kamimoto, Shigemi; and Miyata, Akira, to Fujitsu Limited. Multichip data shifting system. 4,490,809, Cl. 364-900.000.
Ueki, Tadashi: *See*—
Takeshima, Takahiko; Ueki, Tadashi; Kawashima, Motozo; Ueno, Thuneo; and Nishimoto, Masayuki, 4,489,771, Cl. 164-305.000.
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, to Nippon Oil Company, Limited. Pitch for carbon fibers. 4,490,239, Cl. 208-44.000.
Uenaka, Akimitsu: *See*—
Shindow, Kenji; Uenaka, Akimitsu; Izumo, Takaharu; Fujishima, Teruyoshi; and Yamamoto, Satoshi, 4,490,417, Cl. 427-388.300.
Ueno, Thuneo: *See*—
Takeshima, Takahiko; Ueki, Tadashi; Kawashima, Motozo; Ueno, Thuneo; and Nishimoto, Masayuk., 4,489,771, Cl. 164-305.000.
Ueno, Wataru: *See*—
Akashi, Goro; and Ueno, Wataru, 4,490,762, Cl. 360-128.000.
UI Group, Inc.: *See*—
Schmidt, Dieter; Buschor, Josef; and Spillner, Wayne K., 4,489,646, Cl. 99-330.000.
Ulbricht, William H., Jr., to United States of America, Energy. Time of flight mass spectrometer. 4,490,610, Cl. 250-287.000.
Ullrich, Ray D.; Sherman, Douglas C.; and Licon, Leo, Jr., to Combustion Engineering, Inc. Splice locking device. 4,490,065, Cl. 403-379.000.
Umehara, Teruo; and Matsumoto, Norio, to Hitachi Metals, Ltd. Actuator for use in a pickup device for a video disk player. 4,490,815, Cl. 369-43.000.
Umehara, Yozaburo. Toilet bowl. 4,489,447, Cl. 4-240.000.
Underwood, Herbert N., to Borg-Warner Corporation. Dual wet output clutch for power selection in a continuously variable transmission. 4,489,622, Cl. 74-361.000.
Underwood, Mark R., to Probe Adventures, Inc. Axial flow combine. 4,489,733, Cl. 130-24.000.
Ungerbock, Gottfried: *See*—
Chevillat, Pierre R.; Kaser, Hans P.; Maiwald, Dietrich G. U.; and Ungerbock, Gottfried, 4,490,807, Cl. 364-736.000.
Unified Technologies, Inc.: *See*—
Benfield, Sherwood G., 4,490,204, Cl. 156-290.000.
Union Carbide Australia, Limited: *See*—
Thomson, Bruce J., 4,490,323, Cl. 264-211.000.
Union Carbide Corporation: *See*—
Acomb, Byron H.; and Gusky, Frank J., 4,489,751, Cl. 137-505.360.
Garska, Daniel C.; and Flanigen, Edith M., 4,490,568, Cl. 585-415.000.
Nausedas, Joseph A., 4,489,460, Cl. 17-49.000.
Union Oil Company of California: *See*—
Holstedt, Richard A.; and Jessup, Peter, 4,490,265, Cl. 252-47.500.
Uniroyal Ltd.: *See*—
Harris, John W., 4,490,532, Cl. 546-294.000.

United Conveyor Corporation: *See*—
Johnson, Robert W., 4,490,255, Cl. 210-256.000.
United Kingdom Atomic Energy Authority: *See*—
Hardwick, William H.; and Gayler, Ronald, 4,490,287, Cl. 252-629.000.
United States of America
Air Force: *See*—
Fowler, Orren V., 4,490,002, Cl. 339-45.00M.
Van Etten, Paul, 4,490,829, Cl. 375-1.000.
Army: *See*—
Gerhart, Grant R.; and Graziano, James M., 4,490,851, Cl. 382-43.000.
Kwak, Solim S. W., 4,490,345, Cl. 423-389.000.
Nelson, Nyal E., 4,489,531, Cl. 52-741.000.
Stern, Richard A.; and Babbitt, Richard W., 4,490,700, Cl. 333-258.000.
Energy: *See*—
Boenig, Heinrich J., 4,490,769, Cl. 361-58.000.
Brak, Stephen B.; and Milek, Henry F., 4,489,538, Cl. 53-576.000.
Christophorou, Loucas G.; Carter, James G.; and Hunter, Scott R., 4,490,650, Cl. 315-150.000.
Hammond, Robert B.; Paulter, Nicholas G.; and Wagner, Ronald S., 4,490,709, Cl. 338-15.000.
Lancaster, Henry D.; Fugitt, Jock A.; and Howard, Donald R., 4,490,648, Cl. 315-5.410.
Merrill, John T., 4,489,744, Cl. 137-202.000.
Ulbricht, William H., Jr., 4,490,610, Cl. 250-287.000.
Wheatley, John C.; Swift, Gregory W.; and Migliori, Albert, 4,489,553, Cl. 60-516.000.
National Aeronautics and Space Administration: *See*—
Mirtich, Michael J.; Sovey, James S.; and Banks, Bruce A., 4,490,229, Cl. 204-192.00C.
Parker, Loyd C., 4,490,117, Cl. 434-35.000.
Navy: *See*—
Hennings, George N.; Nickles, Richmond H.; Brauer, Larry F.; and DeHarrold, Raymond H., 4,489,656, Cl. 102-254.000.
Katz, Thomas J., 4,490,512, Cl. 526-75.000.
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U.S. Philips Corporation: *See*—
Bunge, Ernst, 4,490,839, Cl. 381-47.000.
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Hamersma, Robert, 4,490,645, Cl. 313-440.000.
Houbregs, Roger J. E.; and Camerik, Eduard, 4,490,011, Cl. 350-255.000.
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Adell, Robert, 4,489,519, Cl. 49-462.000.
United States Surgical Corporation: *See*—
Crawford, John O.; and Gravener, Roy D., 4,489,875, Cl. 227-19.000.
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Moffatt, E. Marston, 4,490,773, Cl. 361-283.000.
Premont, Emile J., 4,490,092, Cl. 415-1.000.
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Martin, Douglas S., 4,489,890, Cl. 239-333.000.
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Dauben, William G.; Jeffries, Phillip R.; and Phillips, Richard B., 4,490,226, Cl. 204-159.000.
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Uno, Syuzo: *See*—
Kamohara, Hideaki; Imamura, Minoru; Higaki, Hiroshi; Yoshitomi, Yuji; Uno, Syuzo; Makino, Kazuhiro; Nomura, Hiroshi; and Yoshioka, Kyozo, 4,489,659, Cl. 104-124.000.
UOP Inc.: *See*—
O'Hara, Mark J.; and Imai, Tamotsu, 4,490,571, Cl. 585-525.000.
Pacanowski, Ronald F.; Sampson, Robert W.; and Kuchar, Paul J., 4,489,592, Cl. 73-30.000.
Verachtert, Thomas A., 4,490,246, Cl. 208-206.000.
Upchurch, Otha D.; and Bosley, Marvin F., to Dumbco Inc. Heavy-duty trench compactor. 4,490,070, Cl. 404-121.000.
Upjohn Company, The: *See*—
Gammill, Ronald B., 4,490,547, Cl. 549-387.000.
Johnson, Roy A., 4,490,531, Cl. 546-269.000.
Johnson, Roy A., 4,490,537, Cl. 548-252.000.
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Sih, John C., 4,490,555, Cl. 562-501.000.
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Battersby, William R., 4,490,447, Cl. 429-143.000.
USV Pharmaceutical Corporation: *See*—
Loev, Bernard; Brown, Richard E.; Huang, Fu-chih; and Jones, Howard, 4,490,373, Cl. 424-250.000.
V. Kann Rasumussen Holding A/S: *See*—
Nissen, Knud E.; and Berneke, Erik S., 4,489,518, Cl. 49-392.000.
Valat, Claude R. Assembly, testing and repair universal stand for motor vehicles. 4,489,500, Cl. 33-394.000.
Valletti, Ennio. Transmitting device for measuring the operating pressure in a system. 4,489,613, Cl. 73-701.000.
Valyocsik, Ernest W., to Mobil Oil Corporation. Synthesis of ZSM-23 zeolite. 4,490,342, Cl. 423-328.000.
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Nally, Robert B.; Akister, James F.; Leung, Patrick C.; and Vance, Eric J., 4,490,850, Cl. 382-34.000.
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van de Plassche, Rudy J.; and Dijkmans, Eise C., to U.S. Philips Corporation. Digital-to-analog converter for bipolar signals. 4,490,714, Cl. 340-347.0DA.
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Amort, Jurgen; Hanisch, Horst; Klapdor, Ute; Suerken, Hans P.; and van der Maas, Hendrikus, 4,490,526, Cl. 536-102.000.
van der Mei, Henk: *See*—
Behr, Norbert; van der Mei, Henk; Sirtl, Wolfgang; Schnegelberger, Harald; and von Ettingshausen, Othmar, 4,490,398, Cl. 426-312.000.
Van der Veken, Louis J. E.: *See*—
Heeres, Jan; and Van der Veken, Louis J. E., 4,490,540, Cl. 548-336.000.
van der Weide, Jouke, to Robert Bosch GmbH. Method for supplying an internal combustion engine with fuel and a fuel supply system for performing the method. 4,489,700, Cl. 123-527.000.
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Lok, Cornelis M.; Verzijl, Dirk; and van Dijk, Jacob, 4,490,480, Cl. 502-315.000.
Van Etten, Paul, to United States of America, Air Force. Detection of angular modulated electromagnetic signals. 4,490,829, Cl. 375-1.000.
van Gulik, Johannes W. Hand weaving loom. 4,489,761, Cl. 139-29.000.
Van Horn, Joseph M.: *See*—
Epstein, Paul; Ballas, John S., Jr.; Mandler, John J., Jr.; and Van Horn, Joseph M., 4,489,726, Cl. 128-630.000.
van Kelst, Willi: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Steffes, Helmut; Bleckmann, Hans-Wilheim; Goosens, Andre F. L.; van Kelst, Willi; and Weise, Lutz, 4,489,989, Cl. 303-92.000.
Van Kerrebroeck, Claude: *See*—
Bensussan, Andre; Birot, Patrice; Van Kerrebroeck, Claude; and Curtinot, Jean-Claude, 4,490,854, Cl. 455-118.000.
Vanlerberghe, Guy: *See*—
Sebag, Henri; and Vanlerberghe, Guy, 4,490,356, Cl. 424-70.000.
Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; Vock, Manfred H.; and Wiegers, Wilhelmus J., to International Flavors & Fragrances Inc. Flavoring with macrocyclic lactone. 4,490,404, Cl. 426-536.000.
Van Loveren, Augustinus G.: *See*—
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Van Overschelde, Daniel M., to Sperry Corporation. Straw discharge deflectors for combine harvesters. 4,489,734, Cl. 130-27.00R.
Van Pool, Joe; and Hann, Paul D., to Phillips Petroleum Company. Ether recovery. 4,490,563, Cl. 568-697.000.
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Van Sloun, Peter H.; and Hall, James C., to Honeywell Inc. Hydrodynamic firing pin. 4,489,654, Cl. 102-204.000.
Varco International, Inc.: *See*—
Boyadjieff, George I., 4,489,794, Cl. 175-85.000.
Varlot, Gerard: *See*—
Malafosse, Jean; Varlot, Gerard; and Pierre, Michel, 4,490,272, Cl. 252-181.300.
Vasta, Joseph A., to Du Pont de Nemours, E. I., and Company. Costing composition of a fluorocarbon polymer and a polyamine curing agent. 4,490,501, Cl. 524-413.000.
Vaught, John L.; Cloutier, Frank L.; Donald, David K.; Meyer, John D.; Tacklind, Christopher A.; and Taub, Howard H., to Hewlett-Packard Company. Thermal ink jet printer. 4,490,728, Cl. 346-1.100.
Vaught, John L., to Hewlett-Packard Company. Ink dispenser with "frozen" solid ink. 4,490,731, Cl. 346-140.00R.
VCS, Incorporated: *See*—
Wurtzinger, Richard E., 4,490,742, Cl. 358-183.000.

VEB Kombinat Textima: *See*—
Lippold, Gerhard; Thurner, Gunther; and Stojanow, Georgi, 4,489,511, Cl. 38-55.000.
Veltman, Preston L. Materials and method for preparing dialysis solutions containing bicarbonate ions. 4,489,535, Cl. 53-431.000.
Venema, Cornelis P.: *See*—
Heijnen, Joseph J.; Lourens, Pieter A.; Venema, Cornelis P.; and Vroemen, Albert J., 4,490,258, Cl. 210-617.000.
Venger, Camille: *See*—
Martin, Gerard M.; Makram-Ebeid, Sherif; and Venger, Camille, 4,489,480, Cl. 29-576.00B.
Venot, Jean: *See*—
Faure, Jean-Louis; and Venot, Jean, 4,489,540, Cl. 57-5.000.
Venuti, Michael C.: *See*—
Jones, Gordon H.; Venuti, Michael C.; Alvarez, Robert; and Bruno, John J., 4,490,371, Cl. 424-248.540.
Verachtert, Thomas A., to UOP Inc. Process for sweetening petroleum fractions. 4,490,246, Cl. 208-206.000.
Verani, Giovanni: *See*—
Costa, Armando; and Verani, Giovanni, 4,489,931, Cl. 271-277.000.
Verbanac, Frank, to A. E. Staley Manufacturing Company. Cellulosic organic solvent soluble products. 4,490,516, Cl. 527-312.000.
Verleger, Jobst: *See*—
Tiemann, Wilhelm; and Verleger, Jobst, 4,490,594, Cl. 200-148.00R.
Versace, Daniel A.: *See*—
Yu, Simon H.; and Versace, Daniel A., 4,490,560, Cl. 568-614.000.
Versteeg, Gijsbert: *See*—
Loggers, Hendrik; and Versteeg, Gijsbert, 4,490,178, Cl. 106-118.000.
Verzijl, Dirk: *See*—
Lok, Cornelis M.; Verzijl, Dirk; and van Dijk, Jacob, 4,490,480, Cl. 502-315.000.
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Marev, Kiril S.; Krachanov, Hristo G.; Bratanov, Anton A.; and Kirchev, Nikolay A., 4,490,335, Cl. 422-269.000.
Vicariesmann, Jurgen: *See*—
Sirch, Edgar; and Vicariesmann, Jurgen, 4,489,645, Cl. 98-36.000.
Vickers, Margaret R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., 4,490,387, Cl. 424-274.000.
Victor, Alan M.: *See*—
Borras, Jaime A.; Suarez, Jose I.; and Victor, Alan M., 4,490,688, Cl. 331-1.00A.
Victor Company of Japan, Ltd.: *See*—
Hirota, Akira, 4,490,749, Cl. 358-320.000.
Machida, Toyotaka; and Aoike, Hitoshi, 4,490,752, Cl. 358-342.000.
Tokuyama, Yoshio, 4,490,755, Cl. 360-70.000.
Vierkotter, Peter: *See*—
vom Hofe, Dieter; and Vierkotter, Peter, 4,489,859, Cl. 222-183.000.
Vinh, Khuong T.: *See*—
Nussbaumer, Dietmar; Perl, Horst; and Vinh, Khuong T., 4,490,256, Cl. 210-359.000.
Viridian, Inc.: *See*—
Quinn, David G.; and Edwards, Robert B., II, 4,490,143, Cl. 604-270.000.
Vitzthum, Gunter H.; and Davis, Michael A., to Akzona Incorporated. 0.1 Micron rated polypropylene membrane and method for its preparation. 4,490,431, Cl. 428-220.000.
Vock, Manfred H.: *See*—
Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; Vock, Manfred H.; and Wiegers, Wilhelmus J., 4,490,404, Cl. 426-536.000.
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,490,544, Cl. 549-228.000.
Voelker, Dennis E.: *See*—
Beckstead, Leo W.; Hogsett, Robert F.; and Voelker, Dennis E., 4,490,339, Cl. 423-58.000.
Voest-Alpine Aktiengesellschaft: *See*—
Schernecker, Alois, 4,489,495, Cl. 33-143.00L.
Vogel, Roger F.; Rennard, Raymond J.; and Tabacek, Joseph A., to Gulf Research & Development Company. Process for preparing catalysts. 4,490,479, Cl. 502-309.000.
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Vogt, Willy, to Bucher-Guyer AG. Press with easily exchangeable proof plates. 4,490,103, Cl. 425-193.000.
Voland, Elmo W., to Emhart Industries, Inc. Timing mechanism. 4,490,589, Cl. 200-38.00R.
Volk, Michael J. Portable power tool table. 4,489,634, Cl. 83-522.000.
Volynets, Filipp K.; Demidenko, Vladimir A.; Denisov, Roman A.; Denx, Viktor P.; Dydelzak, Alexandr E.; Ryzhikov, Engels N.; and Terentieva, Evgenia A., to Institut Fiziki Akademii Nauk Estonskoi SSR. Photochromic and/or cathodochromic sodalite material, method of its preparation, and sensing element of a variable light transmission device manufactured from such material. 4,490,286, Cl. 252-583.000.
vom Hofe, Dieter; and Vierkotter, Peter, to Henkel Kommanditgesellschaft auf Aktien. Closure for a packaging container. 4,489,859, Cl. 222-183.000.
von Beckmann, Helmuth. Ballast shoulder consolidator. 4,489,658, Cl. 104-12.000.
von Ettingshausen, Othmar: *See*—
Behr, Norbert; van der Mei, Henk; Sirtl, Wolfgang; Schnegelberger, Harald; and von Ettingshausen, Othmar, 4,490,398, Cl. 426-312.000.
von Horst, Louis; and Hartl, Alfons, to Horst & Klotz Hopfenveredelung GmbH. Single step extraction of bitter principle and tannins from hops. 4,490,405, Cl. 426-600.000.
von Orelli, Marcus: *See*—
Laanio, Verena; von Orelli, Marcus; and Hausermann, Walter, 4,490,372, Cl. 424-249.000.
Vortex Innerspace Products: *See*—
Dockery, Denzel J., 4,490,250, Cl. 210-169.000.
Vorwerk & Co. Interholding GmbH: *See*—
Simm, Hans-Peter; and Guhne, Wieland, 4,489,620, Cl. 74-42.000.
Voye, Bradford D. Collapsible sawhorse. 4,489,808, Cl. 182-155.000.
Vroemen, Albert J.: *See*—
Heijnen, Joseph J.; Lourens, Pieter A.; Venema, Cornelis P.; and Vroemen, Albert J., 4,490,258, Cl. 210-617.000.
Vsesojuzny Nauchno-Issledovatelsky Institut Gornospasatelnogo Dela: *See*—
Maslyaev, Viktor S.; Sagalovsky, Evgeny S.; Khudosovtseva, Galina P.; Gorovets, Petr M.; Filimonova, Ljudmila Y.; and Zborschik, Ljubov A., 4,490,274, Cl. 252-186.220.
Wade, John A. Railroad track deflection activated grease pump. 4,489,809, Cl. 184-3.100.
Wagner, Joachim: *See*—
Kassat, Harry; Wirth, Friedrich; and Wagner, Joachim, 4,489,775, Cl. 165-67.000.
Wagner, Ronald S.: *See*—
Hammond, Robert B.; Paulter, Nicholas G.; and Wagner, Ronald S., 4,490,709, Cl. 338-15.000.
Wagner, Rudolf: *See*—
Halcour, Kurt; Lange, Peter-Michael; and Wagner, Rudolf, 4,490,487, Cl. 521-53.000.
Wakahata, Yasuo: *See*—
Kawarada, Hiroshi; Tatsumichi, Toshio; Wakahata, Yasuo; Hamanaka, Mitsuyoshi; and Kajitani, Tamotsu, 4,490,015, Cl. 350-340.000.
Waldstrom, Ejvind: *See*—
Degn, Kaj; and Waldstrom, Ejvind, 4,489,536, Cl. 53-450.000.
Walker, Darwyn E.: *See*—
Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,489,543, Cl. 57-208.000.
Walker, John E.: *See*—
Grant, Eric M.; and Walker, John E., 4,490,427, Cl. 428-107.000.
Walker, Lonnie R.: *See*—
Stegemoeller, Calvin L.; and Walker, Lonnie R., 4,490,047, Cl. 366-132.000.
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Wall, Wilfred F.: *See*—
Fleming, Ian D.; Noble, David; Noble, Hazel M.; and Wall, Wilfred F., 4,490,294, Cl. 260-245.300.
Fleming, Ian D.; Noble, David; Noble (formerly Gillett), Hazel M.; and Wall, Wilfred F., 4,490,295, Cl. 260-245.300.
Wallace, David B.: *See*—
Clark, Frederic L.; and Wallace, David B., 4,490,729, Cl. 346-75.000.
Walling, John C.; and Shand, Michael L., to Allied Corporation. Cr-Doped yttrium gallium garnet laser. 4,490,822, Cl. 372-41.000.
Walsh, Richard F.: *See*—
Franks, James A.; Martin, Richard R.; and Walsh, Richard F., 4,490,798, Cl. 364-550.000.
Walter, Lothar: *See*—
Brandenstein, Manfred; Ernst, Horst M.; Walter, Lothar; and Kaschube, Karl-Friedrich, 4,489,992, Cl. 384-496.000.
Walter, Siegfried, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Method for deforming a flat sheet metal workpiece. 4,489,580, Cl. 72-46.000.
Walter, Thomas J., to Ethyl Corporation. 4-(3- and 4-Chlorocyclohex-3-enyl)pyridine intermediates. 4,490,535, Cl. 546-346.000.
Walwyn, Craig M.: *See*—
Rattan, William D.; and Walwyn, Craig M., 4,489,740, Cl. 134-140.000.
Wang, Hsin-Pang, to General Electric Company. Thermal baffle inside a discharge lamp. 4,490,649, Cl. 315-50.000.
Wankel, Felix. Internally axed rotary piston engine. 4,490,101, Cl. 418-164.000.
Ward, Robert H.: *See*—
Browne, James H.; Ward, Robert H.; and Albus, Frank E., 4,489,503, Cl. 34-10.000.
Ward, Robert W. F., to Breckland Meters Limited. Fluid flow meter. 4,489,615, Cl. 73-861.780.
Warheit, Kevin E., to Lancy International, Inc. Process for reconditioning a used ammoniacal copper etching solution containing copper solute. 4,490,224, Cl. 204-130.000.
Warhol, John G. Visor assembly including friction mount. 4,489,974, Cl. 296-97.00K.
Warhol, John G. Apparatus and method for shaping flexible material on a form. 4,490,205, Cl. 156-351.000.
Warner-Lambert Company: *See*—
Cherukuri, S. Rao; Bilka, Kenneth P.; Hriscisce, Frank; and Piccolo, Dominic J., 4,490,395, Cl. 426-3.000.
Gallopo, Andrew R., 4,490,269, Cl. 252-94.000.

Seamans, Ronald E.; and Behnke, Walter E., 4,490,386, Cl. 424-274.000.
Warnke, Wayne L.: *See*—
Yasui, Toshihiro; and Warnke, Wayne L., 4,489,954, Cl. 280-21.00R.
Warrin, George E.: *See*—
Kleesattel, Claus; and Warrin, George E., 4,490,114, Cl. 433-105.000.
Watabe, Tomiji; Kondo, Hideo; Matsuda, Toshihiko; Yano, Kenji; Dote, Yasuhiko; and Takagi, Matao, to Muroran Institute of Technology. Method and apparatus for generating electric power by waves. 4,490,621, Cl. 290-42.000.
Watanabe, Hideyuki: *See*—
Fujiwara, Tatsuro; Watanabe, Hideyuki; Hirano, Takao; and Sakakibara, Hideo, 4,490,524, Cl. 536-7.100.
Watanabe, Hiroshi; and Izumi, Eiki, to Hitachi Construction Machinery Co., Ltd. Failure detection system for hydraulic pump. 4,489,551, Cl. 60-328.000.
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Watanabe, Takashi: *See*—
Shiohata, Kouki; Fujisawa, Fumio; Watanabe, Takashi; and Ishibashi, Yasumasa, 4,489,606, Cl. 73-462.000.
Watanabe, Tatsuya, to Clarion Co., Ltd. Headrest speaker device. 4,490,842, Cl. 381-86.000.
Watanabe, Toshio: *See*—
Kimura, Kensaku; and Watanabe, Toshio, 4,490,107, Cl. 432-11.000.
Watanabe, Yoshikazu: *See*—
Shimba, Satoru; Watanabe, Yoshikazu; Kato, Kazuo; and Yamashita, Kiyotoshi, 4,490,460, Cl. 430-504.000.
Watatani, Yoshizumi: *See*—
Ito, Shigeyuki; and Watatani, Yoshizumi, 4,490,753, Cl. 360-19.100.
Water Services of America, Inc.: *See*—
Baron, Walter J., 4,489,776, Cl. 165-95.000.
Watson, Clifford A.: *See*—
Stamps, Kenneth H.; and Watson, Clifford A., 4,489,647, Cl. 99-336.000.
Watson, James M.: *See*—
Forward, Cleve H.; Butler, James R.; Watson, James M.; and Branum, Gary D., 4,490,570, Cl. 585-467.000.
Watson, Ronald E. Portable weld grinding apparatus. 4,489,524, Cl. 51-170.00R.
Wazenegger, Donald R., to Draper Corporation. Weaving loom selvedge trimmer drive mechanism. 4,489,762, Cl. 139-303.000.
Weatherchem Corporation: *See*—
Davis, R. Melvin, 4,489,864, Cl. 222-541.000.
Webb, Terence C.; Lovell, Peter A.; and Kingston, Samuel B., to Ciba-Geigy AG. Process for the preparation of photographic materials. 4,490,461, Cl. 430-510.000.
Weber, Eckard: *See*—
Barchas, Jack D.; Weber, Eckard; and Evans, Christopher J., 4,490,363, Cl. 424-177.000.
Weber, Georg: *See*—
Eidenschink, Rudolf; Romer, Michael; and Weber, Georg, 4,490,305, Cl. 260-465.00F.
Weber, Hermann, to Techsight Corp. Composition and method for tinting plastic. 4,490,495, Cl. 524-264.000.
Weber, Hieronymus, to Carl Zeiss-Stiftung. Mounting for an airborne telescope. 4,490,026, Cl. 350-567.000.
Weber, Klaus; Gerber, Siegfried; and Fischer, Horst, to Carl-Zeiss-Stiftung, Heidenheim. Specimen holder for microscopes. 4,490,025, Cl. 350-529.000.
Webster, Frank R., to Boeing Company, The. Apparatus for regrinding step drills. 4,489,523, Cl. 51-165.720.
Wedral, Elaine R.: *See*—
Hsu, Jau Y.; Wedral, Elaine R.; and Klinker, William J., 4,490,396, Cl. 426-49.000.
Weeks, Benjamin R. Setting tool and right-hand set mechanical liner hanger. 4,489,781, Cl. 166-208.000.
Weetall, Howard H., to Corning Glass Works. Process and compositions for removing tannins from wine. 4,490,399, Cl. 426-330.400.
Wegman, Richard W.; and Letts, John B., to Shell Oil Company. Process for making aldehydes from diesters of carbonic acid. 4,490,559, Cl. 568-484.000.
Wehrli, Rudolf: *See*—
Hoegerle, Karl; Gsell, Laurenz; and Wehrli, Rudolf, 4,490,375, Cl. 424-251.000.
Weichselgartner, Heinrich, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Method and system for removing tritium from a gas mixture. 4,490,288, Cl. 252-630.000.
Weigert, Hans: *See*—
Schuster, Friedrich; and Weigert, Hans, 4,489,546, Cl. 57-340.000.
Weir, Walter F., to Andrew Corporation. Collapsible rooftop microwave antenna with wind loading feature. 4,490,726, Cl. 343-840.000.
Weisberg, Sharon L.: *See*—
Lahoda, Edward J.; Weisberg, Sharon L.; and White, Robert W., 4,490,225, Cl. 204-158.00R.
Weise, Lutz: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Steffes, Helmut; Bleckmann, Hans-Wilhelm; Goosens, Andre F. L.; van Kelst, Willi; and Weise, Lutz, 4,489,989, Cl. 303-92.000.
Weiss, Aby: *See*—
Franke, Rudiger; and Weiss, Aby, 4,489,818, Cl. 198-311.000.
Weiss, Otmar: *See*—
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,489,698, Cl. 123-502.000.
Weiss, Siegfried; Heurich, Gunther; and Kotzab, Werner, to FAG Kugelfischer Georg Schafer & Co. Bearing-mounted plastic wheel. 4,490,128, Cl. 474-166.000.
Welker, T. L. Trailer. 4,490,089, Cl. 414-483.000.
Wendt, Rainer: *See*—
Lucht, Hartmut; Wendt, Rainer; and Drommert, Heinz, 4,490,040, Cl. 356-318.000.
Wenkman, Gregory; and Salzmann, Ferdinand, to Traex Corporation. Dispensing unit for elongated articles. 4,489,854, Cl. 221-202.000.
Werft, Allan J.: *See*—
Werft, August R., 4,489,943, Cl. 273-84.00R.
Werft, August R., to Werft, Allan J., a part interest. Personal protection device. 4,489,943, Cl. 273-84.00R.
West, Gary A.: *See*—
Gupta, Arunava; West, Gary A.; and Donlan, Jeffrey P., 4,490,192, Cl. 148-188.000.
West, Michael D.; and Dean, Robert H., to International Telephone and Telegraph Corporation. Valve. 4,489,915, Cl. 251-161.000.
Westall, Stephen; and White, James W., to Dow Corning Limited. Organosiloxane-oxyalkylene copolymers. 4,490,416, Cl. 427-387.000.
Westfalia Separator AG: *See*—
Zettler, Karl-Heinz, 4,490,133, Cl. 494-27.000.
Westinghouse Electric Corp.: *See*—
Isenberg, Arnold O., 4,490,444, Cl. 429-31.000.
Lahoda, Edward J.; Weisberg, Sharon L.; and White, Robert W., 4,490,225, Cl. 204-158.00R.
Quan, Wing C., 4,490,775, Cl. 361-406.000.
Steinbruegge, Kenneth B.; and Gottlieb, Milton S., 4,490,845, Cl. 382-1.000.
Sturges, Robert H., Jr., 4,489,587, Cl. 72-389.000.
Westveer, Robert C., to General Signal Corporation. Method and apparatus for reducing operating noise in axial piston pumps and motors. 4,489,642, Cl. 91-499.000.
Wetmore, Judson D.: *See*—
Blaas, Wolfgang; Bergl, Friedrich; and Wetmore, Judson D., 4,489,453, Cl. 5-451.000.
Wheatley, John C.; Swift, Gregory W.; and Migliori, Albert, to United States of America, Energy. Intrinsically irreversible heat engine. 4,489,553, Cl. 60-516.000.
Whitaker, Ranald O. Combinational keyboard utilizing sequential operation of keys. 4,490,056, Cl. 400-100.000.
White Consolidated Industries, Inc.: *See*—
Hull, Warren L.; Leedahl, Wesley C.; and Notch, Donald R., 4,489,470, Cl. 29-157.30C.
White, Graham, to Transmission Research, Inc. Split torque transmission. 4,489,625, Cl. 74-665.00C.
White, James W.: *See*—
Westall, Stephen; and White, James W., 4,490,416, Cl. 427-387.000.
White, Robert W.: *See*—
Lahoda, Edward J.; Weisberg, Sharon L.; and White, Robert W., 4,490,225, Cl. 204-158.00R.
Whittaker, Thomas H.: *See*—
Taylor, Donald M.; and Whittaker, Thomas H., 4,489,949, Cl. 273-423.000.
Wickemeyer, Robert H.: *See*—
Bengelink, Ronald L.; and Wickemeyer, Robert H., 4,489,905, Cl. 244-130.000.
Widjaja, Injas: *See*—
Netter, Gaston; and Widjaja, Injas, 4,489,745, Cl. 137-209.000.
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Macrocyclic carbonates, processes for preparing same, organoleptic uses thereof and intermediates used in said process. 4,490,544, Cl. 549-228.000.
Wiegers, Wilhelmus J.: *See*—
Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; Vock, Manfred H.; and Wiegers, Wilhelmus J., 4,490,404, Cl. 426-536.000.
Wiencek, Donald C.: *See*—
Kirsinas, Peter; Brouwer, John J.; Purpura, Richard M.; and Wiencek, Donald C., 4,489,589, Cl. 72-424.000.
Wienhold, Edgar K.; and Tomm, Donald. Burglar proof clamp for car roof carriers. 4,489,869, Cl. 224-329.000.
Wilczewski, Barbara J. Double post earring structure for pierced ears. 4,489,572, Cl. 63-13.000.
Wild Heerbrugg Aktiengesellschaft: *See*—
Kucher, Gerhard, 4,490,028, Cl. 354-66.000.
Wilhelm, Wilhelm, to Siemens Aktiengesellschaft. Circuit configuration for generating a temperature-independent reference voltage. 4,490,669, Cl. 323-313.000.
Wilkie, Bruce A.: *See*—
Aleksander, Igor; Stonham, Thomas J.; and Wilkie, Bruce A., 4,490,847, Cl. 382-10.000.
Wilkinson Sword Limited: *See*—
Lembke, Max A., 4,489,627, Cl. 76-104.00R.
Wilkison, William W.: *See*—
Chase, Joseph D.; and Wilkison, William W., 4,490,553, Cl. 560-205.000.
Willey, Barry A. Mounting systems for motorcycle windshields and fairings. 4,489,973, Cl. 296-78.100.

Williams, Alfred G.: *See*—
Davies, Gwilym R.; and Williams, Alfred G., 4,490,222, Cl. 204-78.000.

Williams, Barry E. Punch and die storage boxes. 4,489,994, Cl. 312-119.000.

Williams International Corporation: *See*—
Hall, Robert T., 4,489,469, Cl. 29-156.80R.

Williams, James M.: *See*—
Johnson, Carl F.; and Williams, James M., 4,490,055, Cl. 400-51.000.

Williams Patent Crusher and Pulverizer Company: *See*—
Williams, Robert M., 4,489,664, Cl. 110-186.000.

Williams, Robert M. Friction soled shoe slipper. 4,489,510, Cl. 36-103.000.

Williams, Robert M., to Williams Patent Crusher and Pulverizer Company. Closed loop fuel feed system for multiple direct fired burners. 4,489,664, Cl. 110-186.000.

Williams, William R.: *See*—
Gasparaitis, Bernard V.; Krieg, Larry M.; Schweet, Richard R.; Williams, William R.; and Burbank, Raymond W., 4,490,813, Cl. 365-63.000.

Williamson, Thomas R., III, to Motorola, Inc. Lithium/copper oxide or lithium/cadmium oxide organic electrolyte cell. 4,490,448, Cl. 429-194.000.

Wilson, Robert C., Jr.: *See*—
Oleck, Stephen M.; and Wilson, Robert C., Jr., 4,490,242, Cl. 208-97.000.

Windmoller & Holscher: *See*—
Achelpohl, Fritz, 4,490,207, Cl. 156-494.000.

Winkler, Gert; Becker, Wilfried; Zielinski, Erich; and Lipp, Herbert, to Rheinmetall GmbH. Armor car-mounted mortar. 4,489,639, Cl. 89-46.000.

Winzenburg, Mark L.; Fields, Ellis K.; and Shneider, Benjamin L., to Standard Oil Company (Indiana). Cyclic dianhydrides prepared from maleic anhydride. 4,490,545, Cl. 549-234.000.

Wion, Donald A.: *See*—
Over, William R.; Wion, Donald A.; and Heffner, Richard M., 4,489,476, Cl. 29-564.400.

Wirth, Friedrich: *See*—
Kassat, Harry; Wirth, Friedrich; and Wagner, Joachim, 4,489,775, Cl. 165-67.000.

Wirtz, John W.: *See*—
McLane, Jack E.; Schenk, Raymond L.; and Wirtz, John W., 4,489,772, Cl. 164-423.000.

Wirtz Manufacturing Company, Inc.: *See*—
McLane, Jack E.; Schenk, Raymond L.; and Wirtz, John W., 4,489,772, Cl. 164-423.000.

Wisconsin Dairies Cooperative: *See*—
Scoles, John, 4,489,768, Cl. 141-71.000.

Witt, Robert L., to FMC Corporation. Fire-safe seal for swivel joint. 4,489,953, Cl. 277-188.00A.

Wochnowski, Waldemar, to Hauni-Werke Korber & Co. KG. Method and apparatus for reducing the moisture content of tobacco. 4,489,737, Cl. 131-302.000.

Wohlers, Martin R., Jr.: *See*—
Grumet, Alex; and Wohlers, Martin R., Jr., 4,490,849, Cl. 382-31.000.

Wolters, William R.; Chrisman, Charles L.; and Libey, George S., to Purdue Research Foundation. Method for production of a triploid channel catfish and product of method. 4,489,674, Cl. 119-3.000.

Wolverine Corporation: *See*—
Brown, Ernest C.; Buske, Walter E.; and Putnam, Norman A., 4,489,506, Cl. 34-57.00A.

Wolynski, Victor W.; Horian, James G.; and Horian, Robert L., to Calibron Corporation. Casette recorder cleaning unit. 4,490,761, Cl. 360-128.000.

Wong, Thomas H., to Advanced Micro Devices, Inc. Voltage generator. 4,490,670, Cl. 323-313.000.

Wons, Heinz, to Siemens Aktiengesellschaft. X-Ray examination device employing double-slit beam collimation. 4,490,835, Cl. 378-146.000.

Wood, Robin: *See*—
Brittain, David R.; and Wood, Robin, 4,490,381, Cl. 424-273.00R.

Woratyla, John A.: *See*—
Asick, John C.; Douty, George H.; Goodman, Joseph R.; Jones, Kermit M., Jr.; Landis, John M.; Snyder, Clair W., Jr.; Woratyla, John A.; and Zell, Dale R., 4,489,998, Cl. 339-17.0LM.

Wordex: *See*—
Daughters, James R., 4,490,059, Cl. 400-208.000.

World Wide Innovations, Inc.: *See*—
Worst, Joel G.; Grutter, William G.; and Bramer, Walter C., 4,489,874, Cl. 227-7.000.

Worst, Joel G.; Grutter, William G.; and Bramer, Walter C., to World Wide Innovations, Inc. Pallet manufacturing machine. 4,489,874, Cl. 227-7.000.

Worthington, Ralph E.; and Magdics, Alex, to Prodeco, Inc. Process for stripping uranium from an alkyl pyrophosphoric acid. 4,490,336, Cl. 423-10.000.

Wriedt, William A. Holding means apparatus. 4,489,865, Cl. 223-99.000.

Wright, Dolph D.: *See*—
Malarz, Antoni J.; and Wright, Dolph D., 4,489,758, Cl. 137-881.000.

Wright, James H.: *See*—
Mead, Theodore C.; and Wright, James H., 4,490,245, Cl. 208-179.000.

Wright, John G.: *See*—
Ryan, John F.; and Wright, John G., 4,490,087, Cl. 414-417.000.

Wurtzinger, Richard E., to VCS, Incorporated. Encoding apparatus for a closed circuit television system. 4,490,742, Cl. 358-183.000.

Wyatt, Philip J.; Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, to Hitachi, Ltd. Method for determining the properties of wine. 4,490,042, Cl. 356-340.000.

Wygant, James C., to Monsanto Company. Production of chloro-s-triazine triones. 4,490,528, Cl. 544-190.000.

Xerox Corporation: *See*—
Gage, Charles A.; Blair, Timothy T.; and Morgan, Thomas W., 4,490,033, Cl. 355-16.000.
Hoffend, Thomas R.; and Bruzee, Michelle M., 4,490,455, Cl. 430-110.000.

Xoma Corporation: *See*—
Spitler, Lynn E., 4,489,710, Cl. 128-1.00R.

Yaegashi, Takashi: *See*—
Fujii, Setsuro; Aoyama, Takuo; Sakurai, Yojiro; Nakayama, Toyoo; Nunomura, Shigeki; Yaegashi, Takashi; and Okutome, Toshiyuki, 4,490,388, Cl. 424-278.000.

Yagi, Shizuo; Fujii, Isao; and Ajiki, Yoshio, to Honda Giken Kogyo Kabushiki Kaisha. Torch ignition type internal combustion engine. 4,489,686, Cl. 123-260.000.

Yahagi, Tadao: *See*—
Satou, Hiroshi; and Yahagi, Tadao, 4,490,706, Cl. 336-96.000.

Yakura, John, to California Linear Circuits, Inc. Apparatus for making stacked high voltage rectifiers. 4,490,111, Cl. 432-205.000.

Yamada Dobby Co., Ltd.: *See*—
Takase, Yasuhide, 4,489,763, Cl. 139-329.000.

Yamada, Keiichi, to Diesel Kiki Co., Ltd. Fuel injection pump assembly. 4,489,684, Cl. 123-198.00F.

Yamada, Morio, to Toyo Seikan Kaisha, Ltd. Apparatus for dropping liquefied gases. 4,489,767, Cl. 141-48.000.

Yamada, Noboru; and Yamaguchi, Keisuke, to Konishiroku Photo Industry Co., Ltd. Method of supplying a fine-particle powder. 4,489,765, Cl. 141-1.000.

Yamada, Shunichi: *See*—
Ogawa, Yutaka; Yamada, Shunichi; and Hamanaka, Toshiyuki, 4,489,774, Cl. 165-10.000.

Yamada, Sohei; and Miyata, Ichiro, to Aioi Seiki Kabushiki Kaisha. Slide wedge clamp. 4,489,927, Cl. 269-137.000.

Yamada, Takaaki, to Sony Corporation. Variable impedance circuit employing an RIS field effect transistor. 4,490,734, Cl. 357-23.000.

Yamaguchi, Keisuke: *See*—
Yamada, Noboru; and Yamaguchi, Keisuke, 4,489,765, Cl. 141-1.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Isaka, Yoshiharu; and Hosoi, Yukiharu, 4,489,802, Cl. 180-219.000.
Yasui, Toshihiro; and Warnke, Wayne L., 4,489,954, Cl. 280-21.00R.

Yamaha Motor Corporation, U.S.A.: *See*—
Marier, Gregory J., 4,489,801, Cl. 180-190.000.

Yamamoto, Hideo; and Katsube, Seiichi, to Kyodo Kisen Kaisha, Ltd. Heating apparatus for heating liquid in a tank. 4,489,708, Cl. 126-362.000.

Yamamoto, Satoshi: *See*—
Shindow, Kenji; Uenaka, Akimitsu; Izumo, Takaharu; Fujishima, Teruyoshi; and Yamamoto, Satoshi, 4,490,417, Cl. 427-388.300.

Yamamoto, Shu: *See*—
Sakaguchi, Haruo; Seki, Norio; and Yamamoto, Shu, 4,490,020, Cl. 350-96.180.

Yamamoto, Shunichi: *See*—
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Kato, Osamu, 4,490,239, Cl. 208-44.000.

Yamamoto, Takashi: *See*—
Hoshino, Mitsuo; and Yamamoto, Takashi, 4,490,763, Cl. 360-132.000.

Yamamura, Michio, to Tigers Polymer Corporation. Folding hose. 4,489,759, Cl. 138-122.000.

Yamaoka, Nobutatsu: *See*—
Masuyama, Masaru; Hirooka, Susumu; and Yamaoka, Nobutatsu, 4,490,318, Cl. 264-61.000.

Yamashita, Kiyotoshi: *See*—
Shimba, Satoru; Watanabe, Yoshikazu; Kato, Kazuo; and Yamashita, Kiyotoshi, 4,490,460, Cl. 430-504.000.

Yamashita, Yukie: *See*—
Kawaguchi, Yasushi; Mine, Kiyomitsu; Ide, Keiko; Yamashita, Yukie; Irie, Soichiro; and Hirao, Yotaro, 4,490,462, Cl. 430-543.000.

Yanagi, Kenichi: *See*—
Ito, Yoshifumi; Yanagi, Kenichi; Shinoda, Naoharu; and Higaki, Seiji, 4,490,161, Cl. 55-181.000.

Yanagida, Hiroyuki, to Alps Electric Co., Ltd. Intermediate frequency band-pass filter. 4,490,699, Cl. 333-202.000.

Yang, Kang; Starks, Charles M.; and Kerfoot, O. Carl, to Conoco Inc. Method for alkoxylating fluorinated alcohols. 4,490,561, Cl. 568-615.000.

Yano, Kenji: *See*—
Watabe, Tomiji; Kondo, Hideo; Matsuda, Toshihiko; Yano, Kenji; Dote, Yasuhiko; and Takagi, Matao, 4,490,621, Cl. 290-42.000.

Yano, Motoichi: *See*—
Sakano, Hajime; Ito, Akitoshi; Yano, Motoichi; and Honda, Yasuhiro, 4,490,506, Cl. 525-67.000.

Yasuda, Hiroshi; and Ochii, Kiyofumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Signal propagating device for a plurality of memory cells. 4,490,697, Cl. 333-156.000.

Yasui, Koichi: *See*—
Imamura, Kazuyoshi; Yasui, Koichi; and Saito, Akeomi, 4,490,415, Cl. 427-358.000.
Yasui, Toshihiro; and Warnke, Wayne L., to Yamaha Hatsudoki Kabushiki Kaisha. Anti-rolling system for snowmobile of small size. 4,489,954, Cl. 280-21.00R.
Yazawa, Hirosi: *See*—
Okada, Tokio; Kojima, Shigezo; Tani, Haruhisa; Kurihara, Kazuhiko; and Yazawa, Hirosi, 4,489,630, Cl. 83-15.000.
Yeadon, Edward C.; and Laciny, Richard W., to Crosfield Electronics Limited. Position sensor. 4,490,608, Cl. 250-235.000.
Yeakey, Ernest L.: *See*—
Sung, Rodney L.; Yeakey, Ernest L.; Foucher, Walter D., Jr.; and Cuscurida, Michael, 4,490,154, Cl. 44-70.000.
Yianilos, Peter N.; and Buss, Samuel R. String comparator device system circuit and method. 4,490,811, Cl. 364-900.000.
Yokota, Kenichi; Nishita, Shigeo; and Sakauchi, Takashi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Resinous composition having an increased flame retardance. 4,490,498, Cl. 524-371.000.
Yokotsuka, Akio, to Kino Precision Industries, Ltd. Photographic lens with variable range focus adjustment. 4,490,018, Cl. 350-429.000.
Yokoyama, Makoto, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for filing picture information. 4,490,747, Cl. 358-296.000.
Yokoyama, Naoki: *See*—
Maekawa, Iwao; Omori, Eiji; Uchigasaki, Isao; Tobita, Hideyuki; Yokoyama, Naoki; Tanno, Seikichi; Nakano, Fumio; and Ito, Ren, 4,490,496, Cl. 524-317.000.
Yokoyama, Tatsuro: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Minami, Tamotsu; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,490,393, Cl. 424-263.000.
Yokoyama, Tohei, to Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho. Apparatus for manufacturing metallic fine particles using an electric arc. 4,490,601, Cl. 219-69.00R.
Yonemoto, Masashi; and Kajiyama, Ryuichi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for decelerating elevator at terminating floor. 4,489,811, Cl. 187-29.00R.
Yoshida, Hiroshi; Akashi, Shunji; and Kuse, Kazuki, to Yoshida Kogyo K.K. Intermittent feed mechanism. 4,489,873, Cl. 226-162.000.
Yoshida Kogyo K. K.: *See*—
Takahashi, Kihei, 4,489,486, Cl. 29-769.000.
Yoshida Kogyo K.K.: *See*—
Yoshida, Hiroshi; Akashi, Shunji; and Kuse, Kazuki, 4,489,873, Cl. 226-162.000.
Yoshida, Matsuji: *See*—
Ito, Yoshiyasu; Suematsu, Toshio; Takeda, Yuji; Anzai, Katsushi; and Yoshida, Matsuji, 4,489,689, Cl. 123-339.000.
Yoshida, Takao, to Terumo Corporation. Medical bag and method for manufacturing the same. 4,490,420, Cl. 428-35.000.
Yoshida, Toru, to Fuji Photo Film Co., Ltd. Coating method and apparatus. 4,490,418, Cl. 427-445.000.
Yoshida, Toshihiko: *See*—
Tanaka, Kazunobu; Matsuda, Akihisa; and Yoshida, Toshihiko, 4,490,208, Cl. 156-606.000.
Yoshinaka, Tadaaki, to Sony Corporation. Apparatus for reproducing a video signal. 4,490,750, Cl. 358-320.000.
Yoshino Kogyosho Co., Ltd.: *See*—
Saito, Tadao; and Tazaki, Takaharu, 4,489,861, Cl. 222-207.000.
Yoshioka, Kyozo: *See*—
Kamohara, Hideaki; Imamura, Minoru; Higaki, Hiroshi; Yoshitomi, Yuji; Uno, Syuzo; Makino, Kazuhiro; Nomura, Hiroshi; and Yoshioka, Kyozo, 4,489,659, Cl. 104-124.000.
Yoshitomi, Yuji: *See*—
Kamohara, Hideaki; Imamura, Minoru; Higaki, Hiroshi; Yoshitomi, Yuji; Uno, Syuzo; Makino, Kazuhiro; Nomura, Hiroshi; and Yoshioka, Kyozo, 4,489,659, Cl. 104-124.000.
Yoshizaki, Akira: *See*—
Tanaka, Harumi; Ueda, Hiroshi; Maeda, Keisuke; and Yoshizaki, Akira, 4,490,029, Cl. 354-106.000.
Yoshizawa, Hiroshi: *See*—
Fujikawa, Kanichi; Tsujii, Yasuhiro; Shigehara, Itaru; Isogai, Tatsuo; Yoshizawa, Hiroshi; and Miyaji, Mikio, 4,490,534, Cl. 546-345.000.
Yotsuyanagi, Masahiko; and Fukaya, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of making a solar energy collector element. 4,490,412, Cl. 427-122.000.
Youmans, Douglas G., to Charles Stark Draper Laboratory, Inc., The. Pulsed optical storage system. 4,490,730, Cl. 346-76.00L.
Young, Gary L. Amusement device. 4,489,932, Cl. 272-36.000.
Young, Ronald G. Boat propulsion apparatus. 4,490,119, Cl. 440-14.000.
Young, William S., to Twin Y Corporation. Reversible door and frame assembly. 4,489,517, Cl. 49-382.000.
Yu, Simon H.; and Versace, Daniel A., to B. F. Goodrich Company, The. Decolorizing polymers of epihalohydrin. 4,490,560, Cl. 568-614.000.
Yuhasz, Kathleen M.: *See*—
Crawford, Richard J.; Yuhasz, Kathleen M.; and Curtis, John P., 4,490,353, Cl. 424-52.000.
Yuki, Nakaji; and Kitagawa, Hiroshi, to Agency of Industrial Science and Technology. Method for enrichment of nitrogen in air by the method of adsorption and a carbonaceous adsorbent suitable therefor. 4,490,160, Cl. 55-68.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Schaib, Albert; Manogg, Horst; and Horl, Adolf, 4,489,624, Cl. 74-479.000.
Zampach, Stepan: *See*—
Svercl, Josef; Novak, Jan; and Zampach, Stepan, 4,489,588, Cl. 72-402.000.
Zard, Samir Z.: *See*—
Barton, Derek H. R.; Motherwell, William B.; and Zard, Samir Z., 4,490,296, Cl. 260-397.400.
Zborschik, Ljubov A.: *See*—
Maslyaev, Viktor S.; Sagalovsky, Evgeny S.; Khudosovtseva, Galina P.; Gorovets, Petr M.; Filimonova, Ljudmila Y.; and Zborschik, Ljubov A., 4,490,274, Cl. 252-186.220.
Zell, Dale R.: *See*—
Asick, John C.; Douty, George H.; Goodman, Joseph R.; Jones, Kermit M., Jr.; Landis, John M.; Snyder, Clair W., Jr.; Woratyla, John A.; and Zell, Dale R., 4,489,998, Cl. 339-17.0LM.
Zenith Electronics Corporation: *See*—
Mycynek, Victor; and Rypkema, Jouke N., 4,490,743, Cl. 358-197.000.
Zenner, Armin: *See*—
Scholl, Hans-Joachim; and Zenner, Armin, 4,490,551, Cl. 560-025.000.
Zettler, Karl-Heinz, to Westfalia Separator AG. Self-discharging centrifugal drum outlet valve regulating device. 4,490,133, Cl. 494-27.000.
Ziegelmeyer, Harold R., to Precise Flight, Inc. Selectively integrated throttle spoiler actuator for aircraft. 4,489,907, Cl. 244-203.000.
Zielinski, Erich: *See*—
Winkler, Gert; Becker, Wilfried; Zielinski, Erich; and Lipp, Herbert, 4,489,639, Cl. 89-46.000.
Zierenberg, Bernd, to Boehringer Ingelheim K.G. Process for producing film. 4,490,322, Cl. 264-205.000.
Zimmerman, Robert R.; Kunkler, Larry D.; and Helderman, Earl R., to Tektronix, Inc. Method and device for metallizing the internal surface of a hollow object. 4,490,408, Cl. 427-42.000.
Zimmermann, Werner; and Langer, Helmar, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Material testing apparatus using ultrasonic testing heads. 4,489,611, Cl. 73-625.000.
Zoccatelli, Giuseppe: *See*—
Adami nee Michelini, Giuseppina; and Zoccatelli, Giuseppe, 4,490,085, Cl. 414-229.000.
Zoche, Gunter: *See*—
Feld, Marcel; and Zoche, Gunter, 4,490,297, Cl. 260-429.00R.
Zolle, Lise. Carrier-free radiolabelled metyrapones. 4,490,350, Cl. 424-1.100.
Zyczynski, Jozef: *See*—
Plaskura, Andrzej; Lachman, Ignacy; Byrka, Tadeusz; Leszczynski, Zbigniew; Rogalski, Krzysztof; Koch, Marta; and Zyczynski, Jozef, 4,490,310, Cl. 261-79.00A.
Zyngier, John F., to General Motors Corporation. Adjustable headrest. 4,489,979, Cl. 297-391.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF DECEMBER, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alcide Corporation: *See*—
Alliger, Howard, Re. 31,779, Cl. 252-187.230.

Alliger, Howard, to Alcide Corporation. Germ-killing composition and method. Re. 31,779, Cl. 252-187.230.

Carascon, Walter; Dyett, Derek H.; and Hoath, Grantley R., to Molins Ltd. Feeding device for cigarette filters and similar rods. Re. 31,777, Cl. 406-28.000.

Clark, Carl A.; and Rogala, John, to Eastern Company, The. Resin reinforced expansion anchor and method of installation. Re. 31,776, Cl. 405-261.000.

Cooper, Scott A.; Shetty, Ramakrishna; and Pinsky, Jules, to Mearl Corporation, The. Multilayer light-reflecting film. Re. 31,780, Cl. 428-212.000.

Dwyer, Francis G., to Mobil Oil Corporation. Isomerization of monocyclic alkyl aromatic hydrocarbons. Re. 31,781, Cl. 585-481.000.

Dyett, Derek H.: *See*—
Carascon, Walter; Dyett, Derek H.; and Hoath, Grantley R., Re. 31,777, Cl. 406-28.000.

Eastern Company, The: *See*—
Clark, Carl A.; and Rogala, John, Re. 31,776, Cl. 405-261.000.

Haag, Werner O.: *See*—
Olson, David H.; and Haag, Werner O., Re. 31,782, Cl. 585-481.000.

Hoath, Grantley R.: *See*—
Carascon, Walter; Dyett, Derek H.; and Hoath, Grantley R., Re. 31,777, Cl. 406-28.000.

Mearl Corporation, The: *See*—
Cooper, Scott A.; Shetty, Ramakrishna; and Pinsky, Jules, Re. 31,780, Cl. 428-212.000.

Mobil Oil Corporation: *See*—
Dwyer, Francis G., Re. 31,781, Cl. 585-481.000.
Olson, David H.; and Haag, Werner O., Re. 31,782, Cl. 585-481.000.

Molins Ltd.: *See*—
Carascon, Walter; Dyett, Derek H.; and Hoath, Grantley R., Re. 31,777, Cl. 406-28.000.

Olson, David H.; and Haag, Werner O., to Mobil Oil Corporation. Xylene isomerization. Re. 31,782, Cl. 585-481.000.

Persson, Torsten B., to Scan-Web I/S. Method and an apparatus for distributing a disintegrated material onto a layer forming surface. Re. 31,775, Cl. 141-1.000.

Pinsky, Jules: *See*—
Cooper, Scott A.; Shetty, Ramakrishna; and Pinsky, Jules, Re. 31,780, Cl. 428-212.000.

Rogala, John: *See*—
Clark, Carl A.; and Rogala, John, Re. 31,776, Cl. 405-261.000.

Scan-Web I/S: *See*—
Persson, Torsten B., Re. 31,775, Cl. 141-1.000.

Shetty, Ramakrishna: *See*—
Cooper, Scott A.; Shetty, Ramakrishna; and Pinsky, Jules, Re. 31,780, Cl. 428-212.000.

Winnick, Jack. Electrochemical separation and concentration of sulfur containing gases from gas mixtures. Re. 31,778, Cl. 204-130.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

British Petroleum Company Limited, The: *See*—
Math, Friedrich C., B1 4,343,124, Cl. 52-226.000.

Ethyl Products Company: *See*—
Ostrowsky, Efrem M., B1 4,427,126, Cl. 215-307.000.

Fisher, Paul C.; Schub, Herman; and Kennedy, Roger A., to Fisher, Paul C. Pressurized marking instrument. B1 3,425,779, 12-25-84, Cl. 401-190.000.

Harris Corporation: *See*—
Swanson, Hilmer L., B1 4,164,714, Cl. 330-10.000.

Kennedy, Roger A.: *See*—
Fisher, Paul C.; Schub, Herman; and Kennedy, Roger A., B1 3,425,779, Cl. 401-190.000.

Math, Friedrich C., to British Petroleum Company Limited, The. Structural elements. B1 4,343,124, 12-25-84, Cl. 52-226.000.

Ostrowsky, Efrem M., to Ethyl Products Company. Vented closure. B1 4,427,126, 12-25-84, Cl. 215-307.000.

Schub, Herman: *See*—
Fisher, Paul C.; Schub, Herman; and Kennedy, Roger A., B1 3,425,779, Cl. 401-190.000.

Swanson, Hilmer L., to Harris Corporation. Polyphase PDM amplifier. B1 4,164,714, 12-25-84, Cl. 330-10.000.

LIST OF DESIGN PATENTEES

Allison Corporation: *See*—
Seltzer, Samuel M.; and Dennison, Saul, 276,896, Cl. D10-68.000.

AMF Inc.: *See*—
Dennis, Douglas K., 276,947, Cl. D34-19.000.

Amigo Sales, Inc.: *See*—
Shepard, Melvin E., 276,904, Cl. D12-131.000.

Andersson, Ralf, to Malon AB; and Ledu Corporation. Magnifier lamp. 276,940, 12-25-84, Cl. D16-135.000.

Arnold, William D., to Lee-Rowan Company. Integral hook for a clothes hanger. 276,865, 12-25-84, Cl. D6-257.000.

Arnold, William D., to Lee-Rowan Company. Integral hook for a clothes hanger. 276,866, 12-25-84, Cl. D6-257.000.

Arnold, William D., to Lee-Rowan Company. Integral hook for a clothes hanger. 276,867, 12-25-84, Cl. D6-257.000.

Arnold, William D., to Lee-Rowan Company. Integral hook for a clothes hanger. 276,868, 12-25-84, Cl. D6-257.000.

Astle, William H., to Tri Tool, Inc. Portable pipe end preparation tool with right angle feed control. 276,881, 12-25-84, Cl. D8-61.000.

Astle, William H., to Tri Tool, Inc. Portable pipe end preparation tool with right angle feed control. 276,882, 12-25-84, Cl. D8-61.000.

Bard, Andrew. Commode chair. 276,931, 12-25-84, Cl. D23-48.000.

BASF Aktiengesellschaft: *See*—
Lohrer, Emil; Hirsch, Guenter; and Wolf, Hans J., 276,910, Cl. D14-11.000.

Bell, Melvin C. Stud adapter for a drill chuck. 276,879, 12-25-84, Cl. D8-70.000.

Bellis, Robert D., to Coin Controls Limited. Bezel for a coin or token freed mechanism. 276,924, 12-25-84, Cl. D20-9.000.

Berfield, Robert C.: *See*—
Wacek, Rudolph W.; Berfield, Robert C.; and Meland, Ronald F., 276,948, Cl. D34-23.000.

Biesecker, Frederick N., to Drug Plastics & Glass Company. Plastic bottle. 276,889, 12-25-84, Cl. D9-355.000.

Bissell Inc.: *See*—
Goodrich, Gordon W., 276,945, Cl. D32-49.000.

Blanchard, Steven D.: *See*—
Strenger, John R.; and Blanchard, Steven D., 276,898, Cl. D11-145.000.
Bolin, Clarence G. Toy swing for dolls or the like. 276,927, 12-25-84, Cl. D21-121.000.
Bridgestone Tire Company Limited: *See*—
Kojima, Hiroshi; Nishio, Hideaki; Tanaka, Kazuhiro; and Tsuda, Toru, 276,906, Cl. D12-147.000.
Nishio, Hideaki; Kojima, Hiroshi; Inoue, Akira; and Sakamaki, Yuji, 276,905, Cl. D12-147.000.
Brio Toy AB: *See*—
Petersson, Nils A. I., 276,926, Cl. D21-108.000.
Burnett, Kevin P.: *See*—
Deeley, Frank; Deeley, Lawrence; and Burnett, Kevin P., 276,899, Cl. D11-158.000.
C. & E. Fein GmbH & Co.: *See*—
Unger, Detlef, 276,883, Cl. D8-68.000.
Cabot Corporation: *See*—
Falco, Robert N., 276,855, Cl. D2-259.000.
Canon Kabushiki Kaisha: *See*—
Masaki, Nobuo, 276,916, Cl. D16-32.000.
Carre, Alain. Bottle. 276,892, 12-25-84, Cl. D9-410.000.
Carter, Larry D., to Oy Fiskars AB. Dual knife sharpener with single handle. 276,884, 12-25-84, Cl. D8-93.000.
Carter, Larry D., to Oy Fiskars AB. Knife sharpener. 276,886, 12-25-84, Cl. D8-93.000.
Castelli, S.p.A.: *See*—
Ponzellini, Giulio, 276,864, Cl. D6-196.000.
Chaplin, John B., to Textron Inc. Surface effect ship. 276,901, 12-25-84, Cl. D12-5.000.
Coin Controls Limited: *See*—
Bellis, Robert D., 276,924, Cl. D20-9.000.
Corning Glass Works: *See*—
Gulotta, Gerald D., 276,870, Cl. D7-1.000.
Gulotta, Gerald D., 276,873, Cl. D7-19.000.
Gulotta, Gerald D., 276,875, Cl. D7-40.000.
Mercadante, Ottorino N., 276,874, Cl. D7-34.000.
Cosden Technology, Inc.: *See*—
Fortuna, Vincent E., 276,891, Cl. D9-389.000.
Crews, Jeanette S. Floss holder. 276,942, 12-25-84, Cl. D28-64.000.
Cummings, David C.: *See*—
Phillips, James M.; Gugins, Neil C.; Gugins, Kerry J.; and Cummings, David C., 276,877, Cl. D7-76.000.
Cunningham, Royce. Bicycle bag. 276,907, 12-25-84, Cl. D12-158.000.
Daugherty, Valerie, to Questor Corp. Toy bear. 276,929, 12-25-84, Cl. D21-159.000.
Deeley, Frank; Deeley, Lawrence; and Burnett, Kevin P. Table ornament. 276,899, 12-25-84, Cl. D11-158.000.
Deeley, Lawrence: *See*—
Deeley, Frank; Deeley, Lawrence; and Burnett, Kevin P., 276,899, Cl. D11-158.000.
Delery, Marc; and Vinay, Jean-Paul, to Salomon S.A. Cross-country ski boot. 276,856, 12-25-84, Cl. D2-276.000.
Dennis, Douglas K., to AMF Inc. Cart for curing circuit boards. 276,947, 12-25-84, Cl. D34-19.000.
Dennison, Saul: *See*—
Seltzer, Samuel M.; and Dennison, Saul, 276,896, Cl. D10-68.000.
Doman, Donald W., to Kohler Co. Drinking fountain. 276,869, 12-25-84, Cl. D7-304.000.
Drug Plastics & Glass Company: *See*—
Biesecker, Frederick N., 276,889, Cl. D9-355.000.
Durand, Philippe J. Cup or similar article. 276,871, 12-25-84, Cl. D7-9.000.
Eldon Industries, Inc.: *See*—
Evenson, Mel, 276,922, Cl. D19-76.000.
Evenson, Mel, 276,923, Cl. D19-99.000.
Evenson, Mel, to Eldon Industries, Inc. File housing. 276,922, 12-25-84, Cl. D19-76.000.
Evenson, Mel, to Eldon Industries, Inc. Base plate for use in a filing system. 276,923, 12-25-84, Cl. D19-99.000.
Falco, Robert N., to Cabot Corporation. Earmuff cup or similar article. 276,855, 12-25-84, Cl. D2-259.000.
Fattaleh, John B. Personal dental care appliance. 276,935, 12-25-84, Cl. D24-10.000.
Fattaleh, John B. Personal dental care appliance. 276,936, 12-25-84, Cl. D24-10.000.
Fortuna, Vincent E., to Cosden Technology, Inc. Jar or the like. 276,891, 12-25-84, Cl. D9-389.000.
Franklin, Robert P., to Trans-World Manufacturing Corporation. Merchandise display stand or similar article. 276,863, 12-25-84, Cl. D6-480.000.
Giorgetti, Carlo, to Giorgetti S.p.A. Arm-chair. 276,860, 12-25-84, Cl. D6-57.000.
Giorgetti S.p.A.: *See*—
Giorgetti, Carlo, 276,860, Cl. D6-57.000.
Goodrich, Gordon W., to Bissell Inc. Comb for carpet sweeper brushes. 276,945, 12-25-84, Cl. D32-49.000.
Griggs, Calvin C., to Treace Medical, Inc. Myringotomy tube. 276,937, 12-25-84, Cl. D24-34.000.
Grigorenko, Donald C. Hand-held barbecue spit. 276,878, 12-25-84, Cl. D7-106.000.
Gugins, Kerry J.: *See*—
Phillips, James M.; Gugins, Neil C.; Gugins, Kerry J.; and Cummings, David C., 276,877, Cl. D7-76.000.
Gugins, Neil C.: *See*—
Phillips, James M.; Gugins, Neil C.; Gugins, Kerry J.; and Cummings, David C., 276,877, Cl. D7-76.000.
Gulotta, Gerald D., to Corning Glass Works. Baking dish or the like. 276,870, 12-25-84, Cl. D7-1.000.
Gulotta, Gerald D., to Corning Glass Works. Snack tray or the like. 276,873, 12-25-84, Cl. D7-19.000.
Gulotta, Gerald D., to Corning Glass Works. Cover for a serving dish or the like. 276,875, 12-25-84, Cl. D7-40.000.
Hall, Douglas J., to Oy Fiskars AB. Scissors sharpener. 276,885, 12-25-84, Cl. D8-93.000.
Hancher, Jon W. Jug. 276,890, 12-25-84, Cl. D9-376.000.
Harper, Alton A.: *See*—
Kramer, Joel A.; and Harper, Alton A., 276,858, Cl. D6-36.000.
Kramer, Joel A.; and Harper, Alton A., 276,859, Cl. D6-38.000.
Heap, Jean W., to Pendelfin Studios Limited. Table ornament. 276,900, 12-25-84, Cl. D11-158.000.
Hempe Manufacturing Company, Inc.: *See*—
Keddie, Burton G., 276,861, Cl. D6-64.000.
Hirsch, Guenter: *See*—
Lohrer, Emil; Hirsch, Guenter; and Wolf, Hans J., 276,910, Cl. D14-11.000.
Hoese, Fred O. Motorcycle radio housing. 276,903, 12-25-84, Cl. D12-114.000.
Hohulin, Samuel E.: *See*—
Parker, Kenneth R.; and Hohulin, Samuel E., 276,944, Cl. D32-24.000.
Hoshino, Kunio: *See*—
Kido, Katsutoshi; Mishiro, Benito; Ohta, Kikuo; Hoshino, Kunio; Usami, Satoru; and Murakami, Shinzo, 276,908, Cl. D14-5.000.
Hulber, Loren J.; and Stuertz, William D., to Jostens, Inc. Slidable retainer for a flexable post binder. 276,921, 12-25-84, Cl. D19-32.000.
Inoue, Akira: *See*—
Nishio, Hideaki; Kojima, Hiroshi; Inoue, Akira; and Sakamaki, Yuji, 276,905, Cl. D12-147.000.
Jaeger, Hugh D. Guard link for use in association with a steering wheel column lock. 276,888, 12-25-84, Cl. D8-330.000.
Jostens, Inc.: *See*—
Hulber, Loren J.; and Stuertz, William D., 276,921, Cl. D19-32.000.
Kadota, Toshihiko: *See*—
Takahashi, Manabu; and Kadota, Toshihiko, 276,909, Cl. D14-5.000.
Keddie, Burton G., to Hempe Manufacturing Company, Inc. Combined tool caddy and stool. 276,861, 12-25-84, Cl. D6-64.000.
Kido, Katsutoshi; Mishiro, Benito; Ohta, Kikuo; Hoshino, Kunio; Usami, Satoru; and Murakami, Shinzo, to Matsushita Electric Industrial Co., Ltd. Combined radio and cassette tape recorder. 276,908, 12-25-84, Cl. D14-5.000.
Kohler Co.: *See*—
Doman, Donald W., 276,869, Cl. D7-304.000.
Kojima, Hiroshi; Nishio, Hideaki; Tanaka, Kazuhiro; and Tsuda, Toru, to Bridgestone Tire Company Limited. Vehicle tire. 276,906, 12-25-84, Cl. D12-147.000.
Kojima, Hiroshi: *See*—
Nishio, Hideaki; Kojima, Hiroshi; Inoue, Akira; and Sakamaki, Yuji, 276,905, Cl. D12-147.000.
Kramer, Joel A.; and Harper, Alton A., to Tropitone Furniture Company, Inc. Ottoman. 276,858, 12-25-84, Cl. D6-36.000.
Kramer, Joel A.; and Harper, Alton A., to Tropitone Furniture Company, Inc. Lounge. 276,859, 12-25-84, Cl. D6-38.000.
LaFrance Corporation: *See*—
Peroni, Peter A., 276,920, Cl. D18-11.000.
Ledu Corporation: *See*—
Andersson, Ralf, 276,940, Cl. D16-135.000.
Lee-Rowan Company: *See*—
Arnold, William D., 276,865, Cl. D6-257.000.
Arnold, William D., 276,866, Cl. D6-257.000.
Arnold, William D., 276,867, Cl. D6-257.000.
Arnold, William D., 276,868, Cl. D6-257.000.
Lindstrom, Kenneth E. Rotatable counter display stand. 276,857, 12-25-84, Cl. D6-20.000.
Lohrer, Emil; Hirsch, Guenter; and Wolf, Hans J., to BASF Aktiengesellschaft. Magnetic tape cassette or similar article. 276,910, 12-25-84, Cl. D14-11.000.
Malon AB: *See*—
Andersson, Ralf, 276,940, Cl. D16-135.000.
Maruto Hasegawa Kosakujo, Inc.: *See*—
Tozaburo, Hasegawa, 276,880, Cl. D8-52.000.
Masaki, Nobuo, to Canon Kabushiki Kaisha. Process kit for electrophotographic apparatus. 276,916, 12-25-84, Cl. D16-32.000.
Masuda, Hiroshi. Pendulum clock. 276,895, 12-25-84, Cl. D10-22.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Kido, Katsutoshi; Mishiro, Benito; Ohta, Kikuo; Hoshino, Kunio; Usami, Satoru; and Murakami, Shinzo, 276,908, Cl. D14-5.000.
Okada, Takao; Mishiro, Benito; and Ohta, Kikuo, 276,913, Cl. D14-71.000.
Meland, Ronald F.: *See*—
Wacek, Rudolph W.; Berfield, Robert C.; and Meland, Ronald F., 276,948, Cl. D34-23.000.
Mercadante, Ottorino N., to Corning Glass Works. Plate or the like. 276,874, 12-25-84, Cl. D7-34.000.
Meyerspeer, Bernhard, to Optyl Eyewear Fashion International Corporation. Sunglass. 276,917, 12-25-84, Cl. D16-102.000.
Mishiro, Benito: *See*—
Kido, Katsutoshi; Mishiro, Benito; Ohta, Kikuo; Hoshino, Kunio; Usami, Satoru; and Murakami, Shinzo, 276,908, Cl. D14-5.000.

Okada, Takao; Mishiro, Benito; and Ohta, Kikuo, 276,913, Cl. D14-71.000.
Moriconi, David P., to Victor Technologies, Inc. Keyboard console. 276,914, 12-25-84, Cl. D14-100.000.
Murakami, Shinzo: *See*—
Kido, Katsutoshi; Mishiro, Benito; Ohta, Kikuo; Hoshino, Kunio; Usami, Satoru; and Murakami, Shinzo, 276,908, Cl. D14-5.000.
National Union Elecuric Corporation: *See*—
Parker, Kenneth R.; and Hohulin, Samuel E., 276,944, Cl. D32-24.000.
Nishibori, Hiroshi: *See*—
Sakamoto, Junichi; and Nishibori, Hiroshi, 276,919, Cl. D18-4.000.
Nishio, Hideaki; Kojima, Hiroshi; Inoue, Akira; and Sakamaki, Yuji, to Bridgestone Tire Company Limited. Vehicle tire. 276,905, 12-25-84, Cl. D12-147.000.
Nishio, Hideaki: *See*—
Kojima, Hiroshi; Nishio, Hideaki; Tanaka, Kazuhiro; and Tsuda, Toru, 276,906, Cl. D12-147.000.
Nottingham, John R.; and Spirk, John W., Jr. Toy sink or similar article. 276,928, 12-25-84, Cl. D21-122.000.
Ohta, Kikuo: *See*—
Kido, Katsutoshi; Mishiro, Benito; Ohta, Kikuo; Hoshino, Kunio; Usami, Satoru; and Murakami, Shinzo, 276,908, Cl. D14-5.000.
Okada, Takao; Mishiro, Benito; and Ohta, Kikuo, 276,913, Cl. D14-71.000.
Okada, Takao; Mishiro, Benito; and Ohta, Kikuo, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 276,913, 12-25-84, Cl. D14-71.000.
Olympus Optical Co., Ltd.: *See*—
Takahashi, Manabu; and Kadota, Toshihiko, 276,909, Cl. D14-5.000.
Optyl Eyewear Fashion International Corporation: *See*—
Meyerspeer, Bernhard, 276,917, Cl. D16-102.000.
Oy Finkars AB: *See*—
Carter, Larry D., 276,884, Cl. D8-93.000.
Carter, Larry D., 276,886, Cl. D8-93.000.
Hall, Douglas J., 276,885, Cl. D8-93.000.
Paczko, Terry, to Questor Corp. Toy rabbit rattle. 276,925, 12-25-84, Cl. D21-65.000.
Parker, Bruce H., to Peabody Solid Wastes Management, Inc. Lid for a trash receptacle. 276,932, 12-25-84, Cl. D34-11.000.
Parker, Kenneth R.; and Hohulin, Samuel E., to National Union Electric Corporation. Portable vacuum cleaner. 276,944, 12-25-84, Cl. D32-24.000.
Parrett, Fred. Doghouse or similar article. 276,943, 12-25-84, Cl. D30-1.000.
Pascoe, Lawrence E. Baby pacifier with cord. 276,939, 12-25-84, Cl. D24-46.000.
Peabody Solid Wastes Management, Inc.: *See*—
Parker, Bruce H., 276,932, Cl. D34-11.000.
Peavey Electronics Corp.: *See*—
Feavey, Hartley D., 276,918, Cl. D17-20.000.
Peavey, Hartley D., to Peavey Electronics Corp. Guitar body or similar article. 276,918, 12-25-84, Cl. D17-20.000.
Pedersen, Erling. Surgical pillow. 276,938, 12-25-84, Cl. D24-36.000.
Pendelfin Stadios Limited: *See*—
Heap, Jean W., 276,900, Cl. D11-158.000.
Peritronic Medical Industries, plc: *See*—
Smallhorn, Anthony P., 276,934, Cl. D24-8.000.
Permaflex, Ltd.: *See*—
Whatley, David G., 276,894, Cl. D9-436.000.
Peroni, Peter A., to LaFrance Corporation. Readily disassembled instrument housing. 276,920, 12-25-84, Cl. D18-11.000.
Petersson, Nils A. L., to Brio Toy AB. Toy building block. 276,926, 12-25-84, Cl. D21-108.000.
Phillips, James M.; Gugins, Neil C.; Gugins, Kerry J.; and Cummings, David C. Candy dispensing machine. 276,877, 12-25-84, Cl. D7-76.000.
Pioneer Electronic Corporation: *See*—
Yoshikawa, Katsuya, 276,912, Cl. D14-30.000.
Plugge, Jerome R., to Talbot, Marcel G. Jogging cart for horse. 276,902, 12-25-84, Cl. D12-19.000.
Ponzellini, Giulio, to Castelli, S.p.A. Furniture leg extension unit or similar article. 276,864, 12-25-84, Cl. D6-196.000.
Questor Corp.: *See*—
Daugherty, Valerie, 276,929, Cl. D21-159.000.
Paczko, Terry, 276,925, Cl. D21-65.000.
Redken Laboratories, Inc.: *See*—
Stansbury, Benjamin H., Jr., 276,941, Cl. D28-13.000.
Richards, Richard D., to Wilkinson Sword Limited. Packaging container for razors. 276,893, 12-25-84, Cl. D9-415.000.
Roper, Henry. Disposal tank for chicken carcasses or the like. 276,946, 12-25-84, Cl. D34-7.000.
Sakamaki, Yuji: *See*—
Nishio, Hideaki; Kojima, Hiroshi; Inoue, Akira; and Sakamaki, Yuji, 276,905, Cl. D12-147.000.
Sakamoto, Junichi; and Nishibori, Hiroshi, to Sharp Corporation. Electronic cash register. 276,919, 12-25-84, Cl. D18-4.000.
Sakurai, Shigeki. Pocket knife. 276,887, 12-25-84, Cl. D8-99.000.
Salomon S.A.: *See*—
Delery, Marc; and Vinay, Jean-Paul, 276,856, Cl. D2-276.000.
Schmidt, Robert J. Adaptor to permit recording on a cassette. 276,911, 12-25-84, Cl. D14-11.000.
Seltzer, Samuel M.; and Dennison, Saul, to Allison Corporation. Automobile compass. 276,896, 12-25-84, Cl. D10-68.000.
Sharp Corporation: *See*—
Sakamoto, Junichi; and Nishibori, Hiroshi, 276,919, Cl. D18-4.000.
Shepard, Melvin E., to Amigo Sales, Inc. Mobile chair for the handicapped. 276,904, 12-25-84, Cl. D12-131.000.
Shop-Vac Corporation: *See*—
Wacek, Rudolph W.; Berfield, Robert C.; and Meland, Ronald F., 276,948, Cl. D34-23.000.
Smallhorn, Anthony P., to Peritronic Medical Industries, plc. Combined pump and telescopic support pole. 276,934, 12-25-84, Cl. D24-8.000.
Spirk, John W., Jr.: *See*—
Nottingham, John R.; and Spirk, John W., Jr., 276,928, Cl. D21-122.000.
Stansbury, Benjamin H., Jr., to Redken Laboratories, Inc. Hair dryer. 276,941, 12-25-84, Cl. D28-13.000.
Stockton, Scott L. Headband or the like. 276,854, 12-25-84, Cl. D2-241.000.
Strenger, John R.; and Blanchard, Steven D. Portable greenhouse. 276,898, 12-25-84, Cl. D11-145.000.
Stuertz, William D.: *See*—
Hulber, Loren J.; and Stuertz, William D., 276,921, Cl. D19-32.000.
Summers, Joseph E. Fishing lure. 276,930, 12-25-84, Cl. D22-27.000.
Takahashi, Manabu; and Kadota, Toshihiko, to Olympus Optical Co., Ltd. Combined tape recorder and radio. 276,909, 12-25-84, Cl. D14-5.000.
Talbot, Marcel G.: *See*—
Plugge, Jerome R., 276,902, Cl. D12-19.000.
Tanaka, Kazuhiro: *See*—
Kojima, Hiroshi; Nishio, Hideaki; Tanaka, Kazuhiro; and Tsuda, Toru, 276,906, Cl. D12-147.000.
Textron Inc.: *See*—
Chaplin, John B., 276,901, Cl. D12-5.000.
Tozaburo, Hasegawa, to Maruto Hasegawa Kosakujo, Inc. Snap ring pliers. 276,880, 12-25-84, Cl. D8-52.000.
Trane Company, The: *See*—
Welch, Donald C.; and Yoerg, Christopher P., 276,933, Cl. D23-136.000.
Trans-World Manufacturing Corporation: *See*—
Franklin, Robert P., 276,863, Cl. D6-480.000.
Treace Medical, Inc.: *See*—
Griggs, Calvin C., 276,937, Cl. D24-34.000.
Tri Tool, Inc.: *See*—
Astle, William H., 276,881, Cl. D8-61.000.
Astle, William H., 276,882, Cl. D8-61.000.
Tropitone Furniture Company, Inc.: *See*—
Kramer, Joel A.; and Harper, Alton A., 276,858, Cl. D6-36.000.
Kramer, Joel A.; and Harper, Alton A., 276,859, Cl. D6-38.000.
Tsuda, Toru: *See*—
Kojima, Hiroshi; Nishio, Hideaki; Tanaka, Kazuhiro; and Tsuda, Toru, 276,906, Cl. D12-147.000.
Unger, Detlef, to C. & E. Fein GmbH & Co. Electric hand drill. 276,883, 12-25-84, Cl. D8-68.000.
U.S. Philips Corporation: *See*—
Van Asten, Jan F., 276,876, Cl. D7-49.000.
Upton, Garthop. Combined wall mounted support and soap holder. 276,862, 12-25-84, Cl. D6-90.000.
Usami, Satoru: *See*—
Kido, Katsutoshi; Mishiro, Benito; Ohta, Kikuo; Hoshino, Kunio; Usami, Satoru; and Murakami, Shinzo, 276,908, Cl. D14-5.000.
Van Asten, Jan F., to U.S. Philips Corporation. Fruit-press. 276,876, 12-25-84, Cl. D7-49.000.
Victor Technologies, Inc.: *See*—
Moriconi, David P., 276,914, Cl. D14-100.000.
Vinay, Jean-Paul: *See*—
Delery, Marc; and Vinay, Jean-Paul, 276,856, Cl. D2-276.000.
Wacek, Rudolph W.; Berfield, Robert C.; and Meland, Ronald F., to Shop-Vac Corporation. Dolly for a tank, barrel, or the like. 276,948, 12-25-84, Cl. D34-23.000.
Welch, Donald C.; and Yoerg, Christopher P., to Trane Company, The. Heat exchanger. 276,933, 12-25-84, Cl. D23-136.000.
Whatley, David G., to Permaflex, Ltd. Combined container cap and holder for lighter refill adapters. 276,894, 12-25-84, Cl. D9-436.000.
Wilbourn, James R. Deburring machine. 276,915, 12-25-84, Cl. D15-124.000.
Wilkinson Sword Limited: *See*—
Richards, Richard D., 276,893, Cl. D9-415.000.
Williams Industries, Inc.: *See*—
Williams, William J., 276,872, Cl. D7-17.000.
Williams, William J., to Williams Industries, Inc. Combined bowl and lid. 276,872, 12-25-84, Cl. D7-17.000.
Wolf, Hans J.: *See*—
Lohrer, Emil; Hirsch, Guenter; and Wolf, Hans J., 276,910, Cl. D14-11.000.
Woods, Stephanie C. Telescoping measuring stick. 276,897, 12-25-84, Cl. D10-70.000.
Yoerg, Christopher P.: *See*—
Welch, Donald C.; and Yoerg, Christopher P., 276,933, Cl. D23-136.000.
Yoshikawa, Katsuya, to Pioneer Electronic Corporation. Loudspeaker. 276,912, 12-25-84, Cl. D14-30.000.

LIST OF PLANT PATENTEES

Kaiser, Herbert, to Oglevee Associates, Inc. Distinct variety of Streptocarpus named Fantasie. 5,379, 12-25-84, Cl. 68.000.

Moore, Ralph S., to Sequoia Nursery. Rose plant. 5,376, 12-25-84, Cl. 7.000.

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Schmidt, Robert H. Almond tree (Pearl). 5,377, 12-25-84, Cl. 30.000.

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Turner, Ted L., Sr. *Nerium oleander* plant—Turner's Shari D. 5,378, 12-25-84, Cl. 54.000.

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 25, 1984

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

153 4,489,443
160 4,489,444
247 4,489,445

CLASS 3

1.5 4,489,446

CLASS 4

240 4,489,447
574 4,489,448

CLASS 5

86 4,489,449
250 4,489,450
414 4,489,451
451 4,489,453
465 4,489,452
503 4,489,454

CLASS 8

158 4,489,455
539 4,490,149
610 4,490,150
639 4,490,151

CLASS 10

43 4,489,456

CLASS 15

41 R 4,489,457
246 4,489,458

CLASS 16

248 4,489,459

CLASS 17

49 4,489,460

CLASS 19

258 4,489,461
306 4,489,462

CLASS 24

277 4,489,463
279 4,489,464
289 4,489,465
489 4,489,466
525 4,489,467

CLASS 29

156.8 R 4,489,468
4,489,469
157.3 C 4,489,470
243.52 4,489,471
426.5 4,489,472
451 4,489,473
508 4,489,474
526 R 4,489,475
564.4 4,489,476
569 L 4,489,477
574 4,489,478
575 4,489,479
576 B 4,489,480
591 4,489,481
4,489,482
602 R 4,489,483
603 4,489,484
620 4,489,485
769 4,489,486
840 4,489,487
881 4,489,488

CLASS 30

2 4,489,489
90.1 4,489,490
90.7 4,489,491
241 4,489,492
387 4,489,493

CLASS 33

138 4,489,494
143 L 4,489,495
172 E 4,489,497
172 R 4,489,496
180 AT 4,489,498
181 R 4,489,499
394 4,489,500

CLASS 34

8 4,489,501
4,489,502
10 4,489,503
4,489,504
57 A 4,489,506
57 R 4,489,505
77 4,489,507
78 4,489,508

CLASS 36

7.1 R 4,489,509
103 4,489,510

CLASS 38

55 4,489,511

CLASS 40

154 4,489,512
447 4,489,513
476 4,489,514

CLASS 42

1 R 4,489,515

CLASS 43

7 4,489,516

CLASS 44

50 4,490,152
56 4,490,153
70 4,490,154
71 4,490,155

CLASS 48

61 4,490,156
62 R 4,490,157

CLASS 49

382 4,489,517
392 4,489,518
462 4,489,519

CLASS 51

5 D 4,489,520
161 4,489,521
165.71 4,489,522
165.72 4,489,523
170 R 4,489,524
4,489,525
293 4,490,158

CLASS 52

125.6 4,489,526
217 4,489,527
226 B1 4,343,124
677 4,489,528
732 4,489,529
741 4,489,530
4,489,531
748 4,489,532

CLASS 53

151 4,489,534
228 4,489,533
431 4,489,535
450 4,489,536
511 4,489,537
576 4,489,538

CLASS 55

2 4,490,159
68 4,490,160
181 4,490,161
213 4,490,162

CLASS 56

400.02 4,489,539

CLASS 57

5 4,489,540
16 4,489,541
206 4,489,542
208 4,489,543
261 4,489,544
333 4,489,545
340 4,489,546
415 4,489,547

CLASS 59

79.1 4,489,548

CLASS 60

39.02 4,489,549
204 4,489,550
328 4,489,551
389 4,489,552
516 4,489,553
518 4,489,554
534 4,489,555
585 4,489,556
605 4,489,557
4,489,558
4,489,559
4,489,560
641.5 4,489,561
667 4,489,562
673 4,489,563

CLASS 62

48 4,489,564
59 4,489,565
73 4,489,566
138 4,489,567
324.1 4,489,568
514 R 4,489,569
4,489,570
542 4,489,571

CLASS 63

13 4,489,572

CLASS 65

4.21 4,490,163
263 4,490,164

CLASS 66

8 4,489,573

CLASS 68

16 4,489,574
177 4,489,575

CLASS 70

134 4,489,576
452 4,489,577

CLASS 71

88 4,490,165
100 4,490,166
105 4,490,167

CLASS 72

21 4,489,578
38 4,489,579
46 4,489,580
70 4,489,581
98 4,489,582
319 4,489,583
327 4,489,584
387 4,489,585
389 4,489,586
4,489,587
402 4,489,588
424 4,489,589

CLASS 73

1 E 4,489,591
1 G 4,489,590
30 4,489,592
38 4,489,593
49.7 4,489,594
115 4,489,595
116 4,489,596
118 4,489,597
146 4,489,598
146.5 4,489,599
275 4,489,600
290 R 4,489,601
327 4,489,602
337 4,489,603
432 R 4,489,604
455 4,489,605
462 4,489,606
4,489,607
487 4,489,608
505 4,489,609
585 4,489,610
625 4,489,611
4,489,612
701 4,489,613
861.54 4,489,614
861.78 4,489,615
861.79 4,489,616
862.19 4,489,617
862.65 4,489,619
864.16 4,489,618

CLASS 74

42 4,489,620
355 4,489,621
361 4,489,622
378 4,489,623
479 4,489,624
665 C 4,489,625
781 R 4,489,626

CLASS 75

10 R 4,490,168
11 4,490,169
26 4,490,170
42 4,490,171
58 4,490,172
4,490,173
82 4,490,174
126 C 4,490,175

CLASS 76

104 R 4,489,627

CLASS 81

185 4,489,628

CLASS 82

1.2 4,489,629

CLASS 83

15 4,489,630
278 4,489,631
404.2 4,489,632
464 4,489,633
522 4,489,634
708 4,489,635

CLASS 84

1.01 4,489,636
1.22 4,489,637

CLASS 89

1.815 4,489,638
46 4,489,639

CLASS 91

189 R 4,489,640
498 4,489,641
499 4,489,642
515 4,489,643
530 4,489,644

CLASS 98

36 4,489,645

CLASS 99

330 4,489,646
336 4,489,647

CLASS 100

191 4,489,648
215 4,489,649

CLASS 101

93.14 4,489,650
93.36 4,489,651
211 4,489,652
415.1 4,489,653

CLASS 102

204 4,489,654
217 4,489,655
254 4,489,656
290 4,489,657

CLASS 104

12 4,489,658
124 4,489,659

CLASS 106

23 4,490,176
4,490,177
118 4,490,178
308 F 4,490,179

CLASS 108

44 4,489,660
113 4,489,661

CLASS 109

66 4,489,662
76 4,489,663

CLASS 110

186 4,489,664
250 4,489,665
297 4,489,666

CLASS 114

67 A 4,489,667
347 4,489,668

CLASS 116

202 4,489,669

CLASS 118

55 4,489,670
412 4,489,671
620 4,489,672

CLASS 119

2 4,489,673
3 4,489,674
22 4,489,675
96 4,489,676
102 4,489,677

CLASS 122

26 4,489,678
32 4,489,788
451 S 4,489,679

CLASS 123

41.05 4,489,680
52 B 4,489,681
58 B 4,489,682
192 B 4,489,683
198 F 4,489,684
4,489,685
260 4,489,686
269 4,489,687
339 4,489,688
417 4,489,689
419 4,489,690
424 4,489,691
425 4,489,692
440 4,489,693
449 4,489,694
481 4,489,695
493 4,489,696
502 4,489,697
4,489,698
525 4,489,699
527 4,489,700
531 4,489,701
564 4,489,702
568 4,489,703

CLASS 124

24 R 4,489,704
35 A 4,489,705

CLASS 126

9 R 4,489,706
127 4,489,707
362 4,489,708
417 4,489,709

CLASS 128

1 R 4,489,710
1.3 4,489,711
6 4,489,712
71 4,489,713
74 4,489,714
75 4,489,715
77 4,489,716
80 C 4,489,718
80 F 4,489,717
80 H 4,489,719
132 D 4,489,720
205.24 4,489,721
207.15 4,489,722
207.16 4,489,723
303 R 4,489,724
346 4,489,725
630 4,489,726
660 4,489,727
4,489,728
4,489,729
4,489,730
690 4,489,731
778 4,489,732

CLASS 130

24 4,489,733
27 R 4,489,734
30H 4,489,735

CLASS 131

282 4,489,736
302 4,489,737
349 4,489,738
352 4,489,739

CLASS 134

1 4,490,180
2 4,490,181
140 4,489,740
179 4,489,741

CLASS 136

203 4,489,742
255 4,490,573

CLASS 137

155 4,489,743
202 4,489,744
209 4,489,745
218 4,489,746
315 4,489,747
384.4 4,489,748
487.5 4,489,749
496 4,489,750
505.36 4,489,751
512.1 4,489,752
512.15 4,489,753
528 4,489,754
625.22 4,489,755
625.33 4,489,756
877 4,489,757
881 4,489,758

CLASS 138

122 4,489,759

CLASS 139

11 4,489,760
29 4,489,761
303 4,489,762
329 4,489,763

CLASS 140

92.1 4,489,764

CLASS 141

1 Re.31,775
4,489,765
27 4,489,766
48 4,489,767
71 4,489,768
91 4,489,769

CLASS 148

1.5 4,490,182
4,490,183
6.15 Z 4,490,185
6.21 4,490,184
11.5 N 4,490,186
12 R 4,490,187
12.7 A 4,490,188
4,490,189
16.6 4,490,190
31.5 4,490,191
188 4,490,192
4,490,193

CLASS 149

2 4,490,194
4,490,195
92 4,490,196

CLASS 150

52 R 4,489,770

CLASS 156

64 4,490,197
71 4,490,198
73.4 4,490,199
143 4,490,200
155 4,490,201
166 4,490,202
251 4,490,203
290 4,490,204
351 4,490,205
384 4,490,206
494 4,490,207
606 4,490,208
643 4,490,209
4,490,210
4,490,211

CLASS 162

298 4,490,212

CLASS 164

305 4,489,771
423 4,489,772
463 4,489,773

CLASS 165

10 4,489,774
67 4,489,775
95 4,489,776
104.26 4,489,777
166 4,489,778

CLASS 166

64 4,489,779
70 4,489,780
208 4,489,781
248 4,489,782
272 4,489,783
288 4,489,784
295 4,489,785
374 4,489,786

CLASS 172

1 4,489,787
443 4,489,789
519 4,489,790
776 4,489,791

CLASS 173

48 4,489,792

CLASS 174

15 S 4,490,578
36 4,490,574
47 4,490,575
65 SS 4,490,576
103 4,490,577

CLASS 175

71 4,489,793
85 4,489,794
320 4,489,795
410 4,489,796

CLASS 177

128 4,489,797
209 4,489,798
4,489,799
212 4,489,800

CLASS 179

2 EC 4,490,579
18 EE 4,490,581
18 FA 4,490,580
81 B 4,490,582
99 R 4,490,583
100 L 4,490,584
107 FD 4,490,585
189 R 4,490,586

CLASS 180

190 4,489,801
219 4,489,802
227 4,489,803
268 4,489,804
271 4,489,805
903 4,489,806

CLASS 182

96 4,489,807
155 4,489,808

CLASS 184

3.1 4,489,809

CLASS 187

3 4,489,810
29 R 4,489,811
4,489,812

CLASS 188

24.21 4,489,813
33 4,489,814

CLASS 190

1 4,489,815

CLASS 192

3.23 4,489,816
18 A 4,489,817

CLASS 198

311 4,489,818
403 4,489,819
448 4,489,820
472 4,489,821
478 4,489,822
499 4,489,823
633 4,489,824
811 4,489,825
812 4,489,826
844 4,489,827
847 4,489,828

CLASS 200

5 A 4,490,587
11 R 4,490,588
38 R 4,490,589
50 C 4,490,590
68.2 4,490,591
81.9 M 4,490,592
144 R 4,490,593
148 R 4,490,594
254 4,490,595

CLASS 201

17 4,490,213

CLASS 203

8 4,490,214
98 4,490,215

CLASS 204

1 T 4,490,216
11 4,490,217
13 4,490,218
23 4,490,219
52 R 4,490,220
72 4,490,221
78 4,490,222
106 4,490,223
130 Re.31,778
4,490,224
158 R 4,490,225
159 4,490,226
192 C 4,490,229
192 R 4,490,228
192 SP 4,490,227
228 4,490,230
263 4,490,231
278 4,490,232
290 R 4,490,233
409 4,490,234
4,490,235
4,490,236

CLASS 206

287 4,489,829
316 4,489,830
371 4,489,831
387 4,489,832
522 4,489,833
534 4,489,834

CLASS 208

11 LE 4,490,238
11 R 4,490,237
44 4,490,239
47 4,490,240
75 4,490,241
97 4,490,242
127 4,490,243
131 4,490,244
179 4,490,245
206 4,490,246

CLASS 209

20 4,490,247
164 4,490,248

CLASS 210

89 4,490,249
169 4,490,250
209 4,490,251
222 4,490,252
238 4,490,253
247 4,490,254
256 4,490,255
359 4,490,256
610 4,490,257
617 4,490,258
704 4,490,259
738 4,490,260

CLASS 211

41 4,489,835
45 4,489,836
86 4,489,837

CLASS 212

264 4,489,838

CLASS 215

10 4,489,839
13 R 4,489,840
203 4,489,841
213 4,489,842
252 4,489,843
307 B1 4,427,126
329 4,489,844
4,489,845

CLASS 219

10.49 R 4,490,596
10.55 E 4,490,597
10.81 4,490,598
61.1 4,490,599
69 R 4,490,601
69 W 4,490,600
370 4,490,602
463 4,490,603

CLASS 220

69 4,489,846
71 4,489,847
90.4 4,489,848
91 4,489,849
323 4,489,850
4,489,851
469 4,489,852

CLASS 221

187 4,489,853
202 4,489,854

CLASS 222

5 4,489,855
148 4,489,856
179 4,489,857
182 4,489,858
183 4,489,859
189 4,489,860
207 4,489,861
263 4,489,862
504 4,489,863
541 4,489,864

CLASS 223

99 4,489,865

CLASS 224

155 4,489,866
222 4,489,867
321 4,489,868
329 4,489,869

CLASS 225

2 4,489,870

CLASS 226

52 4,489,871
117 4,489,872
162 4,489,873

CLASS 227

7 4,489,874
19 4,489,875

CLASS 228

170 4,489,876
178 4,489,877

CLASS 229

27 4,489,878
4,489,879
40 4,489,880

CLASS 235

146 4,490,604

CLASS 236

49 4,489,881
78 D 4,489,882
92 C 4,489,883

CLASS 238

1 4,489,884
349 4,489,885

CLASS 239

88 4,489,886
132.1 4,489,887
183 4,489,888
265.33 4,489,889
333 4,489,890
585 4,489,891
650 4,489,892
691 4,489,893
693 4,489,894

CLASS 241

19 4,489,895
36 4,489,896
167 4,489,897

CLASS 242

18 PW 4,489,898
47.01 4,489,899
56 R 4,489,900
67.2 4,489,901
100.1 4,489,902
131 4,489,903

CLASS 244

75 R 4,489,904
130 4,489,905
158 A 4,489,906
203 4,489,907

CLASS 248

62 4,489,908
99 4,489,909
219.4 4,489,910
238 4,489,911
359 4,489,912

CLASS 250

213 VT 4,490,605
227 4,490,606
4,490,607
235 4,490,608
269 4,490,609
287 4,490,610
316.1 4,490,611
339 4,490,612
341 4,490,613
385 4,490,614
487.1 4,490,615
515.1 4,490,616
560 4,490,617
571 4,490,618

CLASS 251

147 4,489,914
161 4,489,915
214 4,489,916
305 4,489,917
328 4,489,918

CLASS 252

8.5 A 4,490,261
8.55 D 4,490,263
8.55 R 4,490,262
12 4,490,264
47.5 4,490,265
49.8 4,490,266
56 R 4,490,267
62.62 4,490,268
94 4,490,269
106 4,490,270
174.23 4,490,271
181.3 4,490,272
182 4,490,273
186.22 4,490,274
187.23 Re.31,779
189 4,490,275
299.6 4,490,277
299.61 4,490,276
299.63 4,490,278
357 4,490,279
368 4,490,280
382 4,490,281
503 4,490,282
512 4,490,283
522 R 4,490,284
551 4,490,285
583 4,490,286
629 4,490,287
630 4,490,288

CLASS 254

346 4,489,919

CLASS 260

112 B 4,490,290
112 R 4,490,289
112.5 LH 4,490,291
239.3 B 4,490,292
243.3 4,490,293
245.3 4,490,294
4,490,295
397.4 4,490,296
429 R 4,490,297
4,490,298
4,490,299
453 AM 4,490,302
453 SP 4,490,300
4,490,301
453.99 4,490,303
457 4,490,304
465 E 4,490,306
465 F 4,490,305
465.1 4,490,307
513 N 4,490,308

CLASS 261

52 4,490,309
79 A 4,490,310
92 4,490,311
98 4,490,312

CLASS 264

4.7 4,490,313
22 4,490,314
40.1 4,490,315
40.7 4,490,316
46.5 4,490,317
61 4,490,318
65 4,490,319
82 4,490,320
109 4,490,321
205 4,490,322
211 4,490,323
4,490,324
4,490,325
315 4,490,326
328.16 4,490,327
533

CLASS 266

283 4,489,920

CLASS 267

141.5 4,489,921
149 4,489,922

CLASS 269

8 4,489,923
23 4,489,924
71 4,489,925
93 4,489,926
137 4,489,927
251 4,489,928
282 4,489,929

CLASS 270

55 4,489,930

CLASS 271

277 4,489,931

CLASS 272

36 4,489,932
65 4,489,933
117 4,489,935
120 4,489,936
137 4,489,937
142 4,489,938

CLASS 273

1 B 4,489,940
1 L 4,489,939
26 A 4,489,941
73 R 4,489,942
84 R 4,489,943
154 4,489,944
167 H 4,489,945
249 4,489,946
271 4,489,947
306 4,489,948
423 4,489,949

CLASS 277

80 4,489,950
83 4,489,951
96.2 4,489,952
188 A 4,489,953

CLASS 280

21 R 4,489,954
242 WC 4,489,955
632 4,489,956
810 4,489,957

CLASS 283

3 4,489,958

CLASS 285

18 4,489,959
45 4,489,960
116 4,489,961
263 4,489,962
350 4,489,963
374 4,489,964

CLASS 290

2 4,490,619
38 R 4,490,620
42 4,490,621
52 4,490,622
55 4,490,623

CLASS 292

34 4,489,965
334 4,489,966
339 4,489,967
340 4,489,968

CLASS 294

50.8 4,489,969
67 AB 4,489,970
143 4,489,971

CLASS 296

35.3 4,489,977
64 4,489,972
78.1 4,489,973
97 K 4,489,974
181 4,489,975
185 4,489,976

CLASS 297

232 4,489,978
391 4,489,979
411 4,489,980
4,489,981
458 4,489,982

CLASS 299

2 4,489,983
5 4,489,984
80 4,489,985
86 4,489,986
4,489,987

CLASS 301

108 S 4,489,988

CLASS 303

92 4,489,989

CLASS 307

66 4,490,624
116 4,490,625
243 4,490,626
290 4,490,627
449 4,490,628
451 4,490,629
455 4,490,630
456 4,490,631
475 4,490,632
4,490,633
573 4,490,634

CLASS 308

6 C 4,489,990

CLASS 310

38 4,490,635
71 4,490,636
237 4,490,637
269 4,490,638
319 4,490,639
325 4,490,640
366 4,490,641

CLASS 312

7.2 4,489,993
119 4,489,994
236 4,489,995
279 4,489,996

CLASS 313

25 4,490,642
391 4,490,643
413 4,490,644
440 4,490,645
579 4,490,646
586 4,490,647

CLASS 315

5.41 4,490,648
50 4,490,649
150 4,490,650
4,490,651
366 4,490,652
403 4,490,653

CLASS 318

130 4,490,654
294 4,490,655
434 4,490,656
4,490,657
484 4,490,658
4,490,659
565 4,490,660
661 4,490,661
685 4,490,662
696 4,490,663
4,490,664
4,490,665
800 4,490,666

CLASS 320

48 4,490,667

CLASS 322

2 R 4,490,668

CLASS 323

313 4,490,669
4,490,670

CLASS 324

55 4,490,671
110 4,490,672
158 R 4,490,673
208 4,490,674
319 4,490,675
376 4,490,676
388 4,490,677
438 4,490,678
446 4,490,679

CLASS 329

117 4,490,680
179 4,490,681

CLASS 330

9 4,490,682
10 B1 4,164,714
51 4,490,683
149 4,490,684
252 4,490,685
258 4,490,686
279 4,490,687

CLASS 331

1 A 4,490,688

CLASS 332

31 T 4,490,689

CLASS 333

1 4,490,690
14 4,490,691
28 R 4,490,692
4,490,693
104 4,490,694
128 4,490,695
137 4,490,696
156 4,490,697
193 4,490,698
202 4,490,699
258 4,490,700

CLASS 335

78 4,490,701
169 4,490,702
212 4,490,703
276 4,490,705

CLASS 336

96 4,490,706

CLASS 337

6 4,490,707
320 4,490,708
372 4,490,704

CLASS 338

15 4,490,709
128 4,490,710

CLASS 339

13 4,489,997
17 CF 4,489,999
4,490,001
17 LM 4,489,998
4,490,000
45 M 4,490,002
75 MP 4,490,003
95 R 4,490,004
278 C 4,490,005

CLASS 340

309.4 4,490,711
347 AD 4,490,713
347 DA 4,490,714
347 DD 4,490,712
634 4,490,715
904 4,490,716
996 4,490,717

CLASS 343

5 MM 4,490,719
5 SA 4,490,718
17.1 PW 4,490,720
368 4,490,721
394 4,490,722
754 4,490,723
765 4,490,724
792.5 4,490,725
840 4,490,726
895 4,490,727

CLASS 346

1.1 4,490,728
75 4,490,729
76 L 4,490,730
140 R 4,490,731
200 4,490,732

CLASS 350

96.18 4,490,020
96.20 4,490,006
96.21 4,490,007
96.23 4,490,009
96.34 4,490,008
128 4,490,010
162.23 4,490,021
255 4,490,011
334 4,490,014
340 4,490,015
363 4,490,024
397 4,490,016
427 4,490,017
429 4,490,018
464 4,490,019
529 4,490,025
567 4,490,026
632 4,490,013
637 4,490,012

CLASS 351

211 4,490,022
226 4,490,023

CLASS 354

21 4,490,027
66 4,490,028
106 4,490,029
322 4,490,030
402 4,490,031

CLASS 355

8 4,490,035
14 R 4,490,032
16 4,490,033
57 4,490,034

CLASS 356

1 4,490,036
4,490,037
5 4,490,038
121 4,490,039
318 4,490,040
334 4,490,041
340 4,490,042
407 4,490,043

CLASS 357

5 4,490,733
23 4,490,734
30 4,490,735
41 4,490,736
73 AJJ 4,490,737

CLASS 358

50 4,490,738
66 4,490,739
75 4,490,740
152 4,490,741
183 4,490,742
197 4,490,743
213 4,490,744
250 4,490,745
286 4,490,746
296 4,490,747
314 4,490,748
320 4,490,749
4,490,750
330 4,490,751
342 4,490,752

CLASS 360

19.1 4,490,753
4,490,754
70 4,490,755
77 4,490,756
94 4,490,757
105 4,490,758
107 4,490,759
126 4,490,760
128 4,490,761
4,490,762
132 4,490,763
133 4,490,764
4,490,765
137 4,490,766
4,490,767

CLASS 361

2 4,490,768
58 4,490,769
94 4,490,770
154 4,490,771
281 4,490,772
283 4,490,773
311 4,490,774
406 4,490,775

CLASS 362

16 4,490,776
221 4,490,777
267 4,490,778

CLASS 363

48 4,490,779
87 4,490,780

CLASS 364

191 4,490,781
200 4,490,782
4,490,783
4,490,784
4,490,785
4,490,786
4,490,787
4,490,788
419 4,490,789
424.1 4,490,790
431.02 4,490,791
431.07 4,490,792
433 4,490,793
4,490,794
477 4,490,795
519 4,490,796
522 4,490,797
550 4,490,798
551 4,490,799
558 4,490,800
564 4,490,801
567 4,490,802
571 4,490,803
4,490,804
728 4,490,805
734 4,490,806
736 4,490,807
802 4,490,808
900 4,490,809
4,490,810
4,490,811
4,490,812

CLASS 365

63 4,490,813

CLASS 366

17 4,490,044
56 4,490,045
76 4,490,046
132 4,490,047
134 4,490,048
4,490,049

CLASS 367

140 4,490,814

CLASS 368

46 4,490,050
109 4,490,051
292 4,490,052

CLASS 369

43 4,490,815
55 4,490,816

CLASS 370

17 4,490,817
26 4,490,818
84 4,490,819
100 4,490,820

CLASS 371

1 4,490,821

CLASS 372

41 4,490,822
95 4,490,823

CLASS 373

93 4,490,824
96 4,490,825
97 4,490,826
103 4,490,827
117 4,490,828

CLASS 374

5 4,490,053

CLASS 375

1 4,490,829
40 4,490,830
94 4,490,831

CLASS 376

281 4,490,836
285 4,490,328

CLASS 378

47 4,490,832
58 4,490,833
110 4,490,834
146 4,490,835

CLASS 381

15 4,490,837
4,490,838
47 4,490,839
48 4,490,840
71 4,490,841
86 4,490,842
102 4,490,843
104 4,490,844

CLASS 382

1 4,490,845
7 4,490,846
10 4,490,847
31 4,490,849
34 4,490,850
43 4,490,851
48 4,490,852
4,490,853
121 4,490,848

CLASS 384

117 4,490,054
428 4,489,991
496 4,489,992

CLASS 400

4,490,055
51 4,490,056
100 4,490,057
124 4,490,058
146 4,490,059
208 4,490,060
617

CLASS 401

53 4,490,061
190 B1 3,425,779

CLASS 403

2 4,490,062
109 4,490,063
255 4,490,064
379 4,490,065
387 4,490,066

CLASS 404

4 4,490,067
6 4,490,068
15 4,490,069
121 4,490,070

CLASS 405

24 4,490,071
45 4,490,072
169 4,490,073
259 4,490,074
261 Re.31,776
273 4,490,075
289 4,490,076

CLASS 406

14 4,490,077
28 Re.31,777
114 4,490,078

CLASS 408

1 R 4,490,079
68 4,490,080

CLASS 409

300 4,490,081

CLASS 411

185 4,490,082
338 4,490,083

CLASS 414

222 4,490,084
229 4,490,085
376 4,490,086
417 4,490,087
457 4,490,088
483 4,490,089
567 4,490,090
749 4,490,091

CLASS 415

1 4,490,092

CLASS 416

26 4,490,093

CLASS 417

42 4,490,094
46 4,490,095
342 4,490,096
401 4,490,097
499 4,490,098

CLASS 418

55 4,490,099
98 4,490,100
164 4,490,101
201 4,490,102

CLASS 419

51 4,490,329

CLASS 422

29 4,490,330
46 4,490,331
241 4,490,333
4,490,334
269 4,490,335

CLASS 423

10 4,490,336
43 4,490,337
54 4,490,338
58 4,490,339
65 4,490,340
242 4,490,341
328 4,490,342
336 4,490,343
341 4,490,344
389 4,490,345
456 4,490,346
521 4,490,347
645 4,490,348
657 4,490,349

CLASS 424

1.1 4,490,350
5 4,490,351
17 4,490,352
52 4,490,353
65 4,490,354
70 4,490,355
4,490,356
85 4,490,357
86 4,490,358
93 4,490,359
95 4,490,360
101 4,490,361
177 4,490,362
4,490,363
4,490,364
4,490,365
180 4,490,366
232 4,490,368
244 4,490,369
246 4,490,370
248.54 4,490,371
249 4,490,372
250 4,490,373
251 4,490,374
4,490,375
4,490,376
256 4,490,377
262 4,490,378
4,490,379
263 4,490,380
4,490,393
270 4,490,382
271 4,490,383
272 4,490,384
4,490,385
273 R 4,490,381
274 4,490,386
4,490,387
278 4,490,388
280 4,490,389
298 4,490,390
312 4,490,414
317 4,490,391
330 4,490,392

CLASS 425

193 4,490,103
197 4,490,104

CLASS 426

2 4,490,394
3 4,490,395
49 4,490,396
276 4,490,397
312 4,490,398
330.4 4,490,399
335 4,490,400
407 4,490,401
422 4,490,402
453 4,490,403
536 4,490,404
600 4,490,405
634 4,490,406

CLASS 427

2 4,490,407
42 4,490,408
44 4,490,409
4,490,410
46 4,490,411
122 4,490,412
262 4,490,413
358 4,490,415
387 4,490,416
388.3 4,490,417
445 4,490,418

CLASS 428

4 4,490,419
35 4,490,420
4,490,421
36 4,490,422
4,490,423
68 4,490,424
90 4,490,425
99 4,490,426
107 4,490,427
110 4,490,428
195 4,490,429
212 Re.31,780
217 4,490,430
220 4,490,431
4,490,432
262 4,490,433
341 4,490,434
4,490,435
403 4,490,436
606 4,490,437
613 4,490,438
614 4,490,439
620 4,490,440
697 4,490,441

CLASS 429

13 4,490,442
27 4,490,443
31 4,490,444
32 4,490,445
57 4,490,446
143 4,490,447
194 4,490,448
196 4,490,449

CLASS 430

57 4,490,450
4,490,451
58 4,490,452
65 4,490,453
84 4,490,454
110 4,490,455
210 4,490,456
311 4,490,457
503 4,490,458
504 4,490,460
505 4,490,459
510 4,490,461
543 4,490,462
581 4,490,463

CLASS 431

65 4,490,105
90 4,490,106

CLASS 432

11 4,490,107
23 4,490,108
106 4,490,109
205 4,490,110
4,490,111

CLASS 433

20 4,490,112
104 4,490,113
105 4,490,114
199 4,490,115
215 4,490,116

CLASS 434

35 4,490,117
178 4,490,118

CLASS 435

4 4,490,464
14 4,490,465
22 4,490,466
101 4,490,467
161 4,490,468
4,490,469
211 4,490,470
253 4,490,471

CLASS 436

504 4,490,472
518 4,490,473

CLASS 440

14 4,490,119
61 4,490,120

CLASS 441

5 4,490,121

CLASS 445

7 4,490,122

CLASS 446

204 4,490,123
464 4,490,124

CLASS 455

118 4,490,854

CLASS 464

11 4,490,125
111 4,490,126

CLASS 472

75 4,489,934

CLASS 474

110 4,490,127
166 4,490,128

CLASS 493

8 4,490,129
106 4,490,130
217 4,490,131
424 4,490,132

CLASS 494

27 4,490,133

CLASS 501

115 4,490,474

CLASS 502

156 4,490,475
203 4,490,476
243 4,490,477
254 4,490,478
309 4,490,479
4,490,483
315 4,490,480
330 4,490,481
339 4,490,482

CLASS 521

27 4,490,484
48 4,490,485
53 4,489,913
4,490,486
4,490,487
88 4,490,488
136 4,490,489
177 4,490,490

CLASS 523

318 4,490,491
443 4,490,492

CLASS 524

68 4,490,493
87 4,490,494
264 4,490,495
317 4,490,496
349 4,490,497
371 4,490,498
376 4,490,499
378 4,490,500
413 4,490,501
445 4,490,502
462 4,490,503
537 4,490,504
591 4,490,505

CLASS 525

67 4,490,506
263 4,490,507
316 4,490,508
328.5 4,490,509
490 4,490,510
507 4,490,511

CLASS 526

75 4,490,512
128 4,490,513
165 4,490,514
298 4,490,515

CLASSIFICATION OF PATENTS

CLASS 527

312 4,490,516
401 4,490,517
4,490,518

CLASS 528

179 4,490,519
315 4,490,520
336 4,490,521
388 4,490,522

CLASS 536

4.1 4,490,523
7.1 4,490,524
54 4,490,525
102 4,490,526

CLASS 544

62 4,490,527
198 4,490,528
260 4,490,529
370 4,490,530
396 4,490,548

CLASS 546

269 4,490,531
294 4,490,532
332 4,490,533
345 4,490,534
346 4,490,535

CLASS 548

112 4,490,536
252 4,490,537
4,490,538
262 4,490,539
336 4,490,540
370 4,490,541
453 4,490,542

CLASS 549

212 4,490,543
228 4,490,544
234 4,490,545
292 4,490,546
387 4,490,547
396 4,490,549
460 4,490,550

CLASS 560

025 4,490,551
130 4,490,552
205 4,490,553

CLASS 562

486 4,490,554
501 4,490,555

CLASS 564

159 4,490,557
508 4,490,556

CLASS 568

58 4,490,558
484 4,490,559
614 4,490,560
615 4,490,561
637 4,490,562
697 4,490,563
730 4,490,564
798 4,490,565
4,490,566

CLASS 585

324 4,490,567
415 4,490,568
4,490,569
467 4,490,570
481 Re.31,781
Re.31,782
525 4,490,571
800 4,490,572

CLASS 604

5 4,490,134
4,490,135
22 4,490,136
28 4,490,137
40 4,490,138
57 4,490,139
65 4,490,140
180 4,490,141
241 4,490,142
270 4,490,143
323 4,490,144
333 4,490,145
358 4,490,146
378 4,490,147
385 4,490,148

CLASSIFICATION OF DESIGNS

D2— 241 276,854
259 276,855
276 276,856
D6— 20 276,857
36 276,858
38 276,859
57 276,860
64 276,861
90 276,862
196 276,864
257 276,865
276,866
276,867
276,868
480 276,863
D7— 1 276,870
9 276,871
17 276,872
19 276,873
34 276,874
40 276,875
49 276,876
76 276,877
106 276,878
304 276,869
D8— 52 276,880
61 276,881
276,882
68 276,883
70 276,879
93 276,884
276,885
276,886
99 276,887
330 276,888
D9— 355 276,889
376 276,890
389 276,891
410 276,892
415 276,893
436 276,894
D10— 22 276,895
68 276,896
70 276,897
D11— 145 276,898
158 276,899
276,900
D12— 5 276,901
19 276,902
114 276,903
131 276,904
147 276,905
276,906
158 276,907
D14— 5 276,908
276,909
11 276,910
276,911
30 276,912
71 276,913
100 276,914
D15— 124 276,915
D16— 32 276,916
102 276,917
135 276,940
D17— 20 276,918
D18— 4 276,919
11 276,920
D19— 32 276,921
76 276,922
99 276,923
D20— 9 276,924
D21— 65 276,925
108 276,926
121 276,927
122 276,928
159 276,929
D22— 27 276,930
D23— 48 276,931
136 276,933
D24— 8 276,934
10 276,935
276,936
34 276,937
36 276,938
46 276,939
D28— 13 276,941
64 276,942
D30— 1 276,943
D32— 24 276,944
49 276,945
D34— 7 276,946
11 276,932
19 276,947
23 276,948

CLASSIFICATION OF PLANTS

P.— 7 5,376
30 5,377
54 5,378
68 5,379

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,489,793		4,489,942		4,490,694		4,490,791		4,489,622		4,490,816
	4,490,198		4,489,980		4,490,710	10 :	4,490,390		4,489,623		4,490,817
	4,490,796		4,489,981		4,490,711		4,490,421		4,489,680		4,164,714
04 :	4,489,515		4,490,001		4,490,723		4,490,484		4,489,687		4,427,126
	4,489,520		4,490,002		4,490,725		4,490,501		4,489,732	18 :	4,489,517
	4,489,572		4,490,042		4,490,728	12 :	4,489,543		4,489,746		4,489,524
	4,489,577		4,490,046		4,490,731		4,489,566		4,489,789		4,489,584
	4,490,138		4,490,053		4,490,737		4,489,815		4,489,823		4,489,674
	4,490,598		4,490,059		4,490,748		4,489,943		4,489,860		4,489,714
	4,490,655		4,490,068		4,490,756		4,489,999		4,489,893		4,489,764
	4,490,713		4,490,087		4,490,766		4,490,039		4,489,897		4,489,988
	4,490,793		4,490,097		4,490,767		4,490,091		4,489,915		4,490,056
	4,490,794		4,490,111		4,490,776		4,490,117		4,489,928		4,490,139
	4,490,797		4,490,115		4,490,801		4,490,134		4,489,938		4,490,173
	4,490,802		4,490,123		4,490,823		4,490,135		4,489,966		4,490,230
06 :	4,489,471		4,490,188		3,425,779		4,490,250		4,489,973		4,490,370
	4,489,479		4,490,200	08 :	4,489,666		4,490,259		4,489,987		4,490,468
	4,489,482		4,490,201		4,489,704		4,490,336		4,490,003		4,490,504
	4,489,489		4,490,216		4,489,932		4,490,448		4,490,050		4,490,589
	4,489,491		4,490,226		4,489,983		4,490,489		4,490,071	19 :	4,489,838
	4,489,549		4,490,234		4,490,032		4,490,667		4,490,082		4,490,391
	4,489,554		4,490,254		4,490,213		4,490,688		4,490,105		4,490,543
	4,489,570		4,490,265		4,490,339		4,490,720		4,490,140		4,490,593
	4,489,576		4,490,270		4,490,452		4,490,761		4,490,143	20 :	4,489,733
	4,489,590		4,490,276		4,490,610		4,490,779		4,490,144		4,489,809
	4,489,594		4,490,282		4,490,721		4,490,782		4,490,246		4,489,881
	4,489,605		4,490,317	09 :	4,489,562		4,490,811		4,490,255		4,490,789
	4,489,607		4,490,331		4,489,651		4,490,813		4,490,308	21 :	4,489,475
	4,489,608		4,490,361		4,489,750		4,490,831		4,490,316		4,489,640
	4,489,618		4,490,363		4,489,851		4,490,840		4,490,384		4,490,055
	4,489,637		4,490,364		4,489,875	13 :	Re.31,778		4,490,411		4,490,273
	4,489,638		4,490,371		4,489,901		4,489,444		4,490,446		4,490,430
	4,489,646		4,490,377		4,489,960		4,489,635		4,490,491		4,490,625
	4,489,656		4,490,380		4,489,978		4,489,880		4,490,514	22 :	4,489,503
	4,489,668		4,490,389		4,490,072		4,489,890		4,490,516		4,489,667
	4,489,702		4,490,414		4,490,157		4,489,996		4,490,545		4,489,780
	4,489,706		4,490,437		4,490,186		4,490,090		4,490,571		4,490,066
	4,489,710		4,490,440		4,490,218		4,490,147		4,490,576		4,490,232
	4,489,715		4,490,473		4,490,354		4,490,772		4,490,581		4,490,472
	4,489,721		4,490,495		4,490,385	16 :	4,489,649		4,490,583		4,490,535
	4,489,738		4,490,510		4,490,396		4,489,868		4,490,587	24 :	4,489,525
	4,489,740		4,490,557		4,490,442		4,490,629		4,490,614		4,489,535
	4,489,744		4,490,573		4,490,466	17 :	4,489,451		4,490,658		4,489,565
	4,489,770		4,490,597		4,490,515		4,489,453		4,490,684		4,489,634
	4,489,794		4,490,626		4,490,517		4,489,460		4,490,692		4,489,795
	4,489,812		4,490,631		4,490,518		4,489,466		4,490,707		4,489,902
	4,489,819		4,490,635		4,490,575		4,489,490		4,490,708		4,489,935
	4,489,822		4,490,639		4,490,577		4,489,509		4,490,727		4,490,070
	4,489,829		4,490,648		4,490,591		4,489,513		4,490,742		4,490,088
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	4,489,867		4,490,686		4,490,719		4,489,592		4,490,792		4,489,506
	4,489,934		4,490,691		4,490,773		4,489,621		4,490,804		4,489,508

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05 : 276,946
06 : 276,862
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06 : 5,376

5,377

48 : 5,378

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